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1920—Thirty Years of Service to Construction—1950

Contractors and Engineers Monthly

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Covering the Field

● Meetings—C&E Was There

Fiercer competition among contractors was the focus of the AGC meet (this page).

A resolution from North Atlantic Highway Officials (page 22): they would halt Federal expansion in state road affairs and hold to 50-50 cost sharing.

Hoover, Eisenhower, and Dougherty walked off with honors from The Moles (page 46).

Upham's retirement was the big news of the ARBA annual convention (page 98).

● Earth Dike to Check Floods

A $783,067 contract (page 5) included 2½ miles of earth dike, three stop-log closing structures, and two pumping stations.

● Dual Highway Graded

And well ahead of schedule, too—742,415 yards of borrow-pit excavation to build the long shallow fills. Page 11.

● Gasoline Plant: Skyscraper

Four buildings and tank and pipe welding aplenty on a gas-plant job, page 14.

A floating foundation to prevent settlement the noteworthy part of a 20-story-building job in Mexico City. See page 50.

● County Black-Tops Gravel

Every year it converts a portion of its gravel or stone roads into low-type blacktop. Page 17 covers the county's other routine work, too, and its shop.

● Aggregate Plant at Dam

Pages 24 and 25 analyze revisions that have been made in aggregate equipment at Bull Shoals Dam to eliminate bugs in the production and cooling systems.

● Roadside Sodding in Badlands

Sod was so scarce it had to be hauled in 16 miles. A power cutter helped, and a shop-made water wagon. Page 34.

● Coulee Pumping Plant

So far, some 27,000 cubic yards of concrete have been placed in the 600 x 100 x 185-foot-high plant at Grand Coulee Dam. The story on page 37 brings you up to date.

● Bituminous Paving

Widening and redecking with two courses of asphaltic concrete have modernized a 20-year-old concrete slab (page 41).

A triple bituminous surface treatment has improved 15 gravel miles (page 89).

● Concrete Widening Slab

A subcontractor steams ahead to the tune of 530 feet an hour of 6-foot strip. Truck-mixers tote batches from paver to pour point, as told on page 55.

● Road Maintenance

Long years out in the field—there's no better formula for successful maintenance, says a division super (page 63).

● Road-Mix at Airport

Some 3,000 square yards of it, 3 inches thick, in 8 hours, thanks to good paver performance. Turn to page 69.

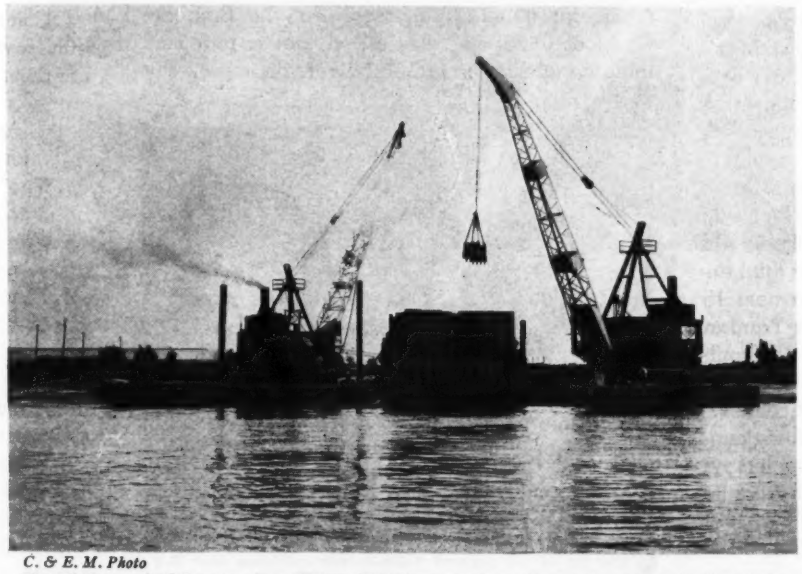
● Dredging, Bridge for Causeway

A double-header on page 74 tells what's what with Georgia's Jekyll Island Causeway: dredging for hydraulic roadway fill and construction of a 4,470-foot bridge.

(You will find "In This Issue" on page 4)

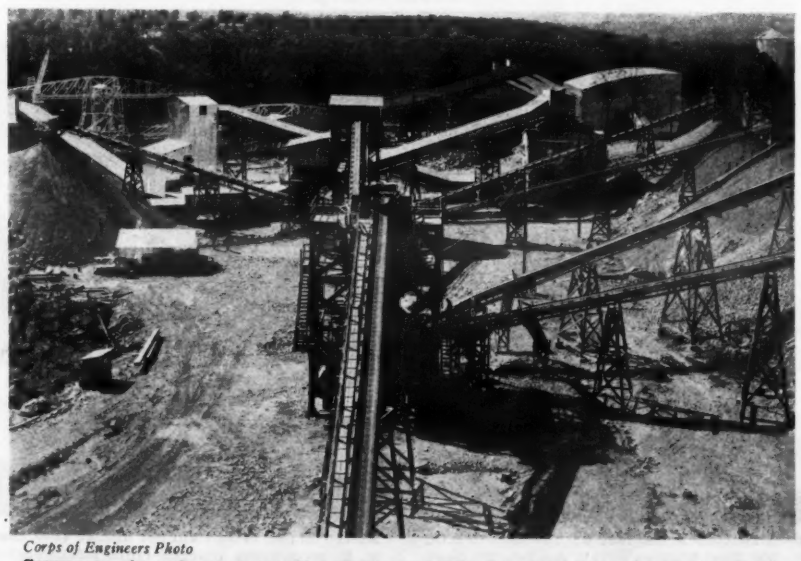
C. & E. M. Photo

Pipe and tank welding for the new gasoline plant at Opelousas, La., was a mammoth job. Sheds with open sides protected the 15 to 20 Lincoln 200-amp welders in use. Page 14 reconstructs for you Hudson Engineering Corp.'s work.



C. & E. M. Photo

Mounted on steel barges, two Wiley Whirleys work on the Turtle River Bridge near Brunswick, Ga. The one on the left excavates at pier 12; the other gets ready to drive H-piles in bent 11. Diamond Construction Co. held the contract described on page 74.



Corps of Engineers Photo

Conveyors zig and zag across the right abutment of Bull Shoals Dam on the White River in Arkansas, where the aggregate-processing plant was set up. A double header article on page 24 gives ins and outs of the big concreting job.

"Fierce" Competition Noted at AGC Parley

Contractors Discuss the Threats to Their Welfare at Annual Meeting in San Francisco

✦ "GENTLEMEN, this time everything is at stake. We are not playing for peanuts!"

These words sounded the seriousness of today's construction business, as 1,500 delegates to the 31st Annual Convention of Associated General Contractors of America gathered in San Francisco's Palace Hotel, February 27 to March 3. The words were spoken by Dr. Edwin G. Nourse, former Chairman of the President's Council of Economic Advisers, as he discussed changing business prospects.

In fact, increasing competition among contractors led the list of current economic problems facing the industry for 1950. The increasingly severe competition, resulting in as many as 35 bids on individual projects, was described by speakers as "fierce", "cut-throat", "suicidal".

But the hope that competition of this nature might prove beneficial was held out by Dr. Nourse, who said that the fight for survival would still leave plenty of contractors to perform the nation's gigantic construction program.

Nourse pointed out that business generally needs to take a fresh look. Now, he said, the situation "calls for pulling a laboring oar against the current". Present economy in the United States is stretched so far that it can't be maintained, Dr. Nourse concluded, and is resulting in a general sapping of strength.

Construction a Stabilizer

The importance of the construction industry as a stabilizing influence on the national economy was told by W. Walter Williams, Seattle investment banker and Chairman of the Board of the Committee for Economic Development. Williams said that because construction was one of the nation's great basic industries, it had "received more than its share of advice and tinkering" by economic planners.

But the construction industry is far too complex and diversified to fit neatly into any simple plan, he said. And, he added, construction's reputation for instability may not be justified. In fact, Williams said, a CED research project indicates that the construction industry has a better-than-average record for stability, despite all previous assumptions to the contrary.

Williams emphasized productivity—or personal production per capita—as an important step in ironing out the excessive economic "peaks and troughs" of the nation's business economy.

Governor Warren Speaks

Convention delegates were welcomed to California by Governor Earl Warren, who said construction made possible

(Continued on page 104)

NEWS AND VIEWS

of the construction industry at home and abroad—volume and trends, state and Federal legislation, labor and materials, people

"Thirty-six bidders on a small sewer job here the other day" . . . "an oversupply of contractors, and most of them bidding as if each letting was the last" . . . "too many contractors and all quite hungry" . . . "I don't believe that I have ever seen a time when there were as many heavy-construction contractors willing, able, and anxious to build" . . . **"competition has gone beyond the use of the word 'keen' and is now in a position called 'rugged'."**

Who says? Contractors themselves, in a survey run off by the AGC for study at its 31st annual convention last month (see page 1 of this issue). **Construction costs,** they report, are stabilizing at about 10 per cent below the 1948 peak . . . **manpower, machinery, and materials** are adequate . . . **labor productivity** is high . . . but 1950 has brought what may be the fiercest competition since the middle 1930's. It's "stimulating and healthy," say some contractors . . . It's "rugged, dangerous, hellish," cry others. Whatever it is, it's a battle, with victory to the keenest cost cutter.

Another national battle which began to shape up during 1949 hit the canvas last month in Washington, at House hearings over the **administration's Federal-Aid bill for highways.** Provisions of Rep. W. M. Whittington's (D., Miss.) bill: $500 million for primary and secondary systems . . . an additional $70 million for the Interstate System . . . a 75-25 matching proposal instead of the historical 50-50 . . . and state option to shift a fourth of the funds between systems. Some of the contestants in the battle of the budget, you remember, have been the **ARBA,** which plugged for increased F-A (Charlie Upham said a total expenditure of $4 billion annually for the next 15 years would do the job) . . . **President Truman** (who urged a hold-the-line F-A policy of $500 million a year) . . . and the **AASHO** (which named $810 million a year as its figure). Latest contenders to enter the ring, led by E. L. Schmidt of Pennsylvania and Spencer Miller, Jr., of New Jersey, were **highway officials of the North-Atlantic states,** who sharply opposed the AASHO's 75-25 proposal. At the February meeting of their association (see page 22), 500 delegates adopted a resolution to the effect that "member states' highway problems can best be solved at the state levels, with a minimum of regulation from the Federal government". As it now stands, Whittington's bill includes the AASHO 75-25 recommendation but sticks close to the President's $500 million figure. Still another bill may be introduced in the Senate by Senator Chavez (D., N. Mex.). As to the final compromise, it's anybody's guess.

A no less spirited local battle is going on in New York over the diversion of road money. Contestants there are Governor Dewey and the New York Good Roads Association headed by Charles H. Sells, former State Superintendent of Public Works. The State expects to take in $169 million this year from gasoline taxes and motor-vehicle registrations . . . but under Dewey's fiscal program, none of this will be available for road construction (see editorial on page 4). Sells and his group are campaigning for a constitutional amendment earmarking at first only part but eventually all of such revenues for highway purposes. The crucial bills were introduced in the New York State Legislature February 21 . . . **New Jersey too is in a ferment over diversion**—specifically, over Governor Driscoll's proposal that the state 1950-51 budget be balanced through "borrowing" $22 million of highway-user tax revenues for general purposes. But the Supreme Court of Oklahoma has ruled that a proposed initiative petition to prohibit diversion is perfectly legal, and has dismissed a protest against it. **Oklahoma voters will have a chance to say "aye" or "no" to diversion in the November general elections.**

In the din of the present Sells-Dewey collision over N.Y. road finances, an ironic flash-back to one year ago: Sells making Dewey Member No. 1 of the N. Y. Good Roads Association. Bertram Tallamy, No. 2 member, smiles unprophetically on the rite.

After all, though, it's hardly news when members of the animal kingdom do battle with another. **Take the ground squirrels and bears in Alaska** . . . The squirrels, it seems, just love gravel dens . . . and, in the absence of natural gravel banks, burrow enthusiastically into Alaskan gravel roads. Alaskan bears, looking for their dinners, dig just as enthusiastically into the roads after the squirrels. Result? Alaskan drivers, speeding home at night to their dinners, land somewhat less enthusiastically in road holes as big as barrels. (We're indebted to Armco's "The Highway Magazine" for this illuminating nature note.)

Alaska, by the by, has filed applications for $18 million of the $70 million authorized by the 81st Congress for **construction of public works in the Territory** . . . and Jess Larson, General Services Administrator, has approved the first allotment of $2,685,214 for 12 projects, 8 of them school and library buildings, 4 of them water, sewer, and street improvements.

On the home front, **legislatures are brimming with revenue bills for public works.** Random samples: The **Texas** legislature has approved state tax increases designed to raise $28 million in the next 18 months for the construction and operation of state hospitals and other institutions . . . The **Oklahoma** Supreme Court has O. K.'d the state's $36 million institutional-building bond issue and ruled that the state treasurer can use funds on deposit to buy the bonds . . . A **Virginia** bill makes $45 million available in state aid for school construction (a trend which began last year in several states including California, Connecticut, Maryland, and North Carolina) . . . **Maryland's** legislature has been asked to create a university building authority to issue revenue bonds for the construction of buildings at College Park and Baltimore . . . **South Carolina** is considering a bill to provide a state bond issue of $40 million for school construction. Whatever the quality of schooling our youngsters are to receive, they'll apparently be well housed while receiving it.

Over 1,200 representatives of the country's construction firms met at the recent ACC convention (see page 1). Here California's Governor Earl Warren greets Adolph Teichert, Jr., Retiring President. W. Walter Williams, President of Continental, Inc., Seattle, and Dr. Edwin G. Nourse, Economist, are left and right of the Governor.

At the Moles recent annual dinner (see the article on page 46), ex-President Hoover and R. E. Dougherty (fourth from left) received the society's 1950 awards. General Eisenhower was made an honorary member. At far left and right are C. J. Proctor, President of The Moles, and William Durkin, President of Walsh Construction Co.

Profs Test Concrete Walk Under Freeze-Thaw Cycle

Every time temperatures dropped anywhere near freezing in Boston this past winter, civil-engineering professors of Northeastern University clapped their hands and danced a jig. And all because of an experimental sidewalk 120 feet long x 4 feet wide.

The walk connects two buildings on campus. But more to the point, it consists of 117 separate blocks of different concrete—some with a lot of cement and some with very little, some cured with wax preparations and others with wet burlap, some with asphalt in them and others without, and so forth. Having built the sidewalk, the professors needed a healthy freeze-thaw cycle to determine the optimum mix of concrete for paving purposes, and to test the efficacy of curing and air-entraining agents. Meanwhile, though, they went on with their interior lab work, freezing concrete samples for 24 hours, thawing them for 24 hours, then measuring sonic modulus and weight loss.

When or if the experimental sidewalk breaks up, it will be rebuilt with additional experimental mixes. The Civil Engineering Department also contemplates an exposure farm at Northeastern. Old man winter had better get busy from now on up there in New England.

Students Draft Plans For Kentucky Bridges

Engineering students at the University of Kentucky are lending a hand in the preparation of plans for bridges and culverts to be constructed on the state's highway system. They have been supplied with the drafting equipment for the job, and are working under the direction of James E. Black, who has been with the Department for 15 years.

It's a valuable service they're rendering the Department, according to E. D. Smith, Highway Bridge Engineer. But on the other hand, the benefits aren't flowing just in one direction either. Their part-time work will help train the students for full-time work in bridge designing should they desire to seek Department employment after graduation.

Selected Bibliography Of Civil Engineering

A selected bibliography of civil-engineering subjects, listing more than 225 titles grouped under 8 headings, has just been published by the Engineers' Council for Professional Development. The list has been prepared as an aid to the engineer who plans to continue his studies in civil engineering or to build a private library in this field.

The titles were selected by more than 100 engineering teachers and professional engineers who cooperated with the ECPD Committee on Professional Training. Most of the books listed are of the college grade. Each listing is annotated to indicate the nature and depth of the subject matter.

Copies may be obtained from ECPD 29 W. 39th St., New York 18, N. Y., by requesting Section III, Civil Engineering. The price is 25 cents.

Highway Congress Agenda

The agenda for the Fifth Pan American Highway Congress to be held at Lima, Peru, December 10-17, this year, has been announced by the Peruvian Highway Association. Highway design, construction, and maintenance are scheduled for discussion. The transit section of the Congress will study size and weight limitations on vehicles using the highways. Plans will be made to encourage the adoption of uniform transit regulations and nomenclature on an international scale. The economic and financial aspects of road building, the future of highway education, and means for international exchange of information will also concern the delegates.

Awards for BPR Officials

Twelve officials of the Bureau of Public Roads received recognition recently for their achievements in Government service. At formal exercises in Washington, Secretary of Commerce Charles Sawyer presented gold medals for exceptional service to Commissioner MacDonald; Deputy Commissioner Herbert S. Fairbank; former Deputy Commissioner Joseph S. Bright, who retired last August after 32 years in Government service; the late Dr. Laurence I. Hewes, Chief of the western headquarters branch of the Bureau in San Francisco; and Edwin W. James, Chief of the Inter-American regional office in Washington.

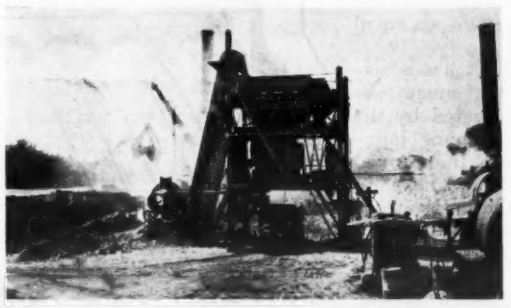
Silver medals for meritorious service were given to Raymond Archibald, Joseph Barnett, Edward H. Holmes, Carl F. Izzard, O. K. Normann, Frank H. Jackson, and William T. Pryor.

President of Naylor Pipe Dies

Carl G. Naylor, founder and President of the Naylor Pipe Co., Chicago, died suddenly at the age of 70. He was instrumental in developing the first spiral-welded pipe and the equipment required to produce it.

The kind of "welcome mat" Florida visitors will appreciate

Laying a dense-graded Texaco Asphaltic Concrete surface over old surface-treated limestone on 12½ miles of State Highway 55 (US 19) in Levy County, Fla.



Modern asphalt plant of the Macasphalt Corporation of Lakeland, Fla., which constructed the Texaco Asphaltic Concrete pavement on State Highway 55.

The "welcome-mat" Florida road builders are putting down for out-of-State motorists in the above photograph is 12½ miles long. It is the new Texaco Asphaltic Concrete surface recently laid over old surface-treated limestone on State Highway 55 along the Florida west coast. Here is the kind of "welcome mat" visitors to the State will appreciate and remember.

While the old oiled limestone highway was outmoded as a riding surface, it provided a well-consolidated foundation for a new top course. It was necessary first to level off the old road with a layer of coarse-graded Texaco Asphaltic Concrete. Then the wearing surface of dense-graded Texaco Asphaltic Concrete was laid to a compacted thickness of 1½ inches.

Hot-mixed, hot-laid Texaco Asphaltic Concrete of the type used on Florida Route 55, as well as the other varieties of Asphaltic Concrete, are described in the helpful booklet, "Texaco Asphalt Paving—Plant-mixed Types". You can secure a copy without obligation by writing our nearest office.

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Uncertain Future for N. Y. Roads

New York State, whose highway system is about as inadequate as that of any state in the union for the traffic it carries, seems destined to remain in that sorry classification for some time to come. The current state budget appropriates $30,000,000 for highway construction, which with matching Federal Aid totals $60,000,000. But reliable estimates indicate that $175,000,000 a year is necessary to put present highways in shape and to build new ones.

Roads are built in New York State with funds obtained from gasoline taxes (4 cents a gallon) and motor-vehicle registration, plus matching Federal funds. New York, however, has no separate highway fund into which all gas taxes and registration fees are placed. Instead, these road-user taxes are diverted into a general fund from which allocation is then made for road work.

According to state law, 37½ per cent of gas taxes and 75 per cent of vehicle registration fees are to be appropriated for highway construction and maintenance. Based on such allocation from revenue, the current highway budget should be over $90,000,000, taken out of the $89,500,000 and $75,500,000 (totaling $165,000,000) realized from gas taxes and registration fees respectively. Yet despite Gov. Thomas E. Dewey's statement of last year that 36 per cent of the state highways were old or worn out, his budget provides only $30,000,000 for highways.

That would mean no new highway or parkway construction in New York for 1950-1951. Yet motor-vehicle registration is rising constantly, and roads are already crowded to capacity. On good week ends this past winter, cars were jammed bumper to bumper on parkways around metropolitan New York. Of the 89 miles of parkways in Westchester County, northern approaches to New York City, only 6 miles are built to modern standards with dual roadways separated by divisor strips. Most of the Long Island parkways east of the city are similarly outmoded, lacking center dividing strips on their tight four lanes, thereby inviting head-on collisions and side-swiping. Conditions will naturally worsen with increased summer driving.

Instead of reconstructing or building new highways and parkways with the money already taken from the road user, the Governor comes up with a strange device to tax the motorist still further. This plan includes completion of the New York to Buffalo 486-mile Thruway under a special authority which would finance the construction by issuing some $400,000,000 worth of its own bonds. Interest and retirement of the bonds would be realized by the sale of an extra license plate which the motorist would have to buy to drive on the Thruway.

This is a far cry from the original plan for the 4-lane non-stop expressway across the state, serving its principal cities. When Gov. Dewey, full of presidential aspirations, broke ground for the first link of the Thruway in July, 1946, the schedule called for its completion within five years at a cost of $200,000,000. To date, only 48 miles have been built over four widely separated sections, and the original estimated cost has now doubled. Its intended free status is to be changed to that of an impractical sort of toll road, discouraging the occasional user who would hesitate about buying a special license to enjoy the superhighway a limited number of times a year. Even large trucking associations, which give heavy business to such toll roads as the Pennsylvania Turnpike, balk at this method of financing the Thruway, and want it paid for out of current revenue from highway users.

The New York Good Roads Association, a private promotional group, has advanced a plan to put the Empire State back on its feet again highway-wise. This association, headed by Charles H. Sells, former N. Y. State Superintendent of Public Works, breaks sharply with the Governor on the highway issue. First of all, the Good Roads people call for an end to the diversion of highway revenue into nonhighway uses. (Only four other states, besides New York, fail to separate highway funds from general funds.) This goal would be achieved gradually so as not to disrupt current budgets. By 1959, however, all gasoline taxes and registration fees would be earmarked for highway purposes, subject to approval by a voter's referendum.

Along with the antidiversion measure, the G-R Association suggests a $500,000,000 bond issue, floated by the state over 8 years, to finance long-overdue road construction. If approved by the legislatures of 1950 and 1951 and by referendum ballot, the bond measure would provide an initial $115,000,000 in 1952. With the $60,000,000 from state appropriation and Federal participation, the sum of $175,000,000 a year would be realized for highways. By 1960, the remainder of the $500,000,000 bond issue would be sold. After that no more bonds would be necessary if antidiversion is in effect. From then on all road work would be paid for out of highway revenue.

This sounds like the most practical plan yet advanced for financing the construction of New York state highways. It is hoped that the state legislatures, and the voters acting on the referendum, will consider the merits of these measures—antidiversion and short-term bond issue—to give New York State the highways it so badly needs.

Bulletins on Soil-Cement

Report No. 8-F, just issued by the Highway Research Board, summarizes the results of four field experiments conducted by the Illinois, Kansas, and Nebraska state highway departments and by the City of Little Rock, Ark., to evaluate the effectiveness of bituminous materials in retaining moisture in soil-cement for 7 days following construction.

According to the tests, the cover materials effectively retained the moisture; produced inferior surfaces when allowed to penetrate the soil-cement; but produced satisfactory surfaces when penetration was prevented by a suitable moisture in the surface of the soil-cement at the time of bituminous application.

The HRB has also reissued "Wartime Road Problems, No. 7" on the incorporation of cement with subgrade soils, borrow soils, and pit-run materials—and combinations of these materials by mixed-in-place, traveling, and stationary-plant methods. The booklet includes ASTM suggested moisture-density, wetting-and-drying, and freezing-and-thawing tests.

Report No. 8-F costs 60 cents a copy; "Wartime Road Problems, No. 7" costs 30 cents a copy. Write to the Highway Research Board, 2101 Constitution Ave., Washington 25, D. C.

Why Be a Highway Engineer?

Be a highway engineer because "There is no more important, no more useful, no more challenging, no more honorable profession than that of highway engineering" and because "Responsibility and opportunity for initiative come early in the state highway departments to qualified young engineers". These are the incentives stressed in the booklet, "Highway Engineering, a Challenge and an Opportunity", compiled by a committee headed by C. R. Hanes, Field Engineer of the Bureau of Construction, Ohio State Highway Department, and published by the American Road Builders' Association. The book is designed to acquaint college students with the possibilities and scope of highway engineering.

The booklet gives a general outline of the qualifications, training, and duties of a highway engineer. Technical know-how, it warns, is not enough for the highway engineer; he must be a salesman as well. Opportunities in the field are pointed out and a study of highway department organization is included.

Copies of the book may be secured for 50 cents each from the ARBA, International Bldg., Washington 4, D. C.

English Report on Soil Survey

Road Research Technical Paper No. 15, "Soil Survey Procedure", has been released by the Department of Scientific & Industrial Research, Rex House, 4-12 Regent St., London, S. W. 1., England. This bulletin stresses the importance of soil surveys in situations such as highway engineering where soil is a material of construction.

The paper describes the technique of soil surveying. It outlines the way in which the results obtained can be interpreted and applied, and deals with the exploration of soil conditions over the site by boring, the preparation of vertical sections, and soil sampling. Methods of recording water-table contours and of drawing a soil profile are explained. Plans are given for a mobile laboratory suitable for soil surveys carried out by local authorities.

This paper may be obtained by writing to the British Information Services, 30 Rockefeller Plaza, New York 20, N. Y. Enclose 30 cents.

"The hock with instinct!"

Earth Dike Protects City Against Floods

Project for Flood Control on Connecticut River Includes Two Large Pumping Stations At West Springfield, Mass.

✦ BY July, the New England Division, Department of the Army, Corps of Engineers, will have completed the flood-control project on the west or right bank of the Connecticut River in front of the Riverdale section of West Springfield, Mass. The contract now under way, by Daniel O'Connell's Sons, Inc., of Holyoke, Mass., includes nearly 2½ miles of earth dike, three stop-log closing structures at highway crossings, and two pumping stations. Estimated construction cost is $783,067.

The protection will prevent a repetition of the disastrous 1936 flood when the Connecticut River poured out of its banks, and sent 6 feet of water over this area through which is located U. S. 5, important north-south New England artery of travel. Work got under way on the project in April, 1949. By the end of the year the dike was practically completed, while the remaining dirt clean-up and pumping-station details will be finished by summer.

The Riverdale Dike, as it is called, is local flood protection. It parallels the river about 150 feet back from the right bank, but ties in to high ground with wing extensions at the north and south ends. It is 12,830 feet long. At the north end the dike begins 200 feet west of U. S. 5 and south of Goldine Brook which flows easterly to the river. The dike runs easterly, with the first of the stop-log structures at the highway intersection, and keeps outside the Wayside Pumping Station, one of the two structures, as it nears the river. At the Chicopee Bridge the second stop-log structure is located. The embankment continues downstream to the south end of the project where it cuts back to the west above Bagg Brook which empties into the river. The Riverdale Pumping Station, the other large drainage unit, is inside the dike at the lower end. Stop-log structure 3 is at the southerly crossing of U. S. 5. The openings for the stop-logs in the dike are 74, 52, and 93 feet wide respectively.

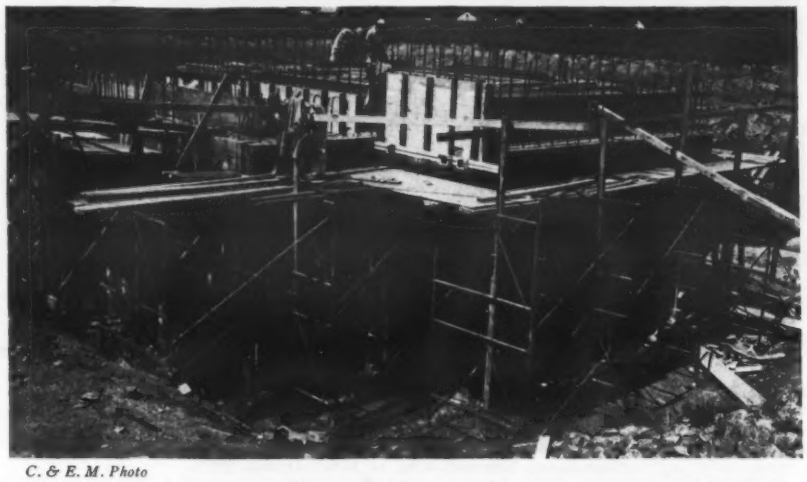
Earth Dike

The dike varies in height from 7 to 17 feet, depending on the topography, and has an average base width of 80 feet. From its 10-foot-wide crown, covered with a 6-inch layer of bank-run gravel, the riverside slope drops down 2½ to 1 while the landside slope is 2 to 1. At the riverside toe a cut-off trench was dug with minimum 5-foot dimensions on both depth and width. The trench was backfilled with impervious material which extends up the riverside slope to the top of the embankment. At the crown the impervious material is 2 feet thick, and about 5 feet thick along the slope. A strip of pervious material, 4 feet thick, runs inside the dike lines at the landside toe. The rest, and bulk of the embankment fill, is made up of random material.

With one exception, both slopes are topsoiled and seeded; the riverside with 6 inches of topsoil, and the landside with 12 inches. At a bend in the river, however, a 1-foot course of dumped rock on 6 inches of bank-run gravel is used on the riverside slope in lieu of topsoil for a 3,000-foot stretch.

For drainage at the landside toe, a 2-foot 8-inch-wide trench was dug down to drainage strata, about 12 to 14 feet, and backfilled with pervious bank-run gravel. About 5 feet from the top a line of 8-inch perforated vitrified-clay pipe was laid. The VC pipe drains into a 12-inch concrete collector pipe that leads to storage basins at the two pumping stations inside the dike, from which it flows to the river at low river stages or is pumped to the river at high river stages.

For additional drainage, 48 foundation relief wells were installed along portions of the landside toe of dike. The wells average 50 feet in depth, and each has a pervious or screen section, a riser-pipe section, and a discharge section. The pervious section at the base of the well consists of a 6-inch VC perforated pipe resting on a length of non-perforated pipe surrounded by screened gravel. The riser sections consist of non-perforated 6-inch VC pipe which connects through a tee section with the discharge pipe.



C. & E. M. Photo

At the Wayside pumping station, carpenters working from Safway scaffolds build forms for the side walls. Daniel O'Connell's Sons, Inc., is the contractor for the $783,067 flood-control project on the Connecticut River.

The wells are equipped with a permanent mandril and flushing pipe of 1¼-inch zinc-coated steel pipe. The end of the discharge pipe is protected by means of a ¼-inch galvanized mesh

(Continued on next page)

It's here! the NEW

HI-MILER RIB TRUCK TIRE

20%-25% MORE mileage at no extra cost!

Now Goodyear presents a great new truck tire that will give you more mileage, more traction, more safety in today's highway hauling service. Improved throughout, this new Hi-Miler Rib Truck Tire delivers *premium performance at no extra cost!*

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C. & E. M. Photos

In a borrow pit on the O'Connell flood-control project, a Thew-Lorain shovel with an Amsco bucket loads a 13-yard Euclid with impervious dike material (above). On top of the dike (at right, top photo) an Autocar dumps 7 yards of material in front of a TD-9 which will level it with its Bucyrus-Erie blade. The fill is compacted (at right, below) by a Blaw-Knox sheepsfoot pulled by an International TD-6.

Earth Dike Protects City Against Floods

(Continued from preceding page)

screen. Discharge from the wells, which will not take place unless the river elevation is higher than that of ground at the landside of dike, is carried to the storage basins by a ditch at the landside dike toe, for disposal by pumping to the river.

Pumping Stations

The two pumping stations, inside the dike, at the upper and lower ends of the protection, have good-size storage basins constructed beside them. The basin at the north, or Wayside station, is 178 feet square, while that for the south, or Riverdale station, is approximately 500 x 150 feet; both are 10 feet deep. Ordinarily the basins are dry except during flood time. They serve as relief valves for flash floods from the hills to the west, and as reservoirs from which floodwaters may be pumped out at leisure, when the pumps may be worked at maximum efficiency.

The stations are built with reinforced-concrete substructures, a structural-steel framework with brick walls and limestone trim, and a flat concrete roof slab. The Wayside structure measures 28 x 20 feet, while the larger Riverdale station is 35 x 22 feet. The former is equipped with 12 and 16-inch pumps, while the latter has 14 and 24-inch pumps with provisions for installing another 24-inch unit if necessary. Economy volute pumps are being installed. The 14-inch pump will be driven by a Westinghouse electric motor, the other pumps by Climax gasoline engines acting through Universal right-angle gear units.

Under normal conditions, drainage flows under the dike at the pumping stations through cast-iron pipes. If the river rises, this gravity flow is stopped by check valves, and the drainage, including that from sewer lines, is turned into the ponds for storage and later discharge by the pumps.

Dirt Work

Dirt work started with stripping the site of the dike and the excavation for the cut-off trench and storage ponds. The stripping, averaging a foot in depth, was done with 4 LeTourneau 14-yard FP Carryalls pulled by Caterpillar D8

(Continued on next page)

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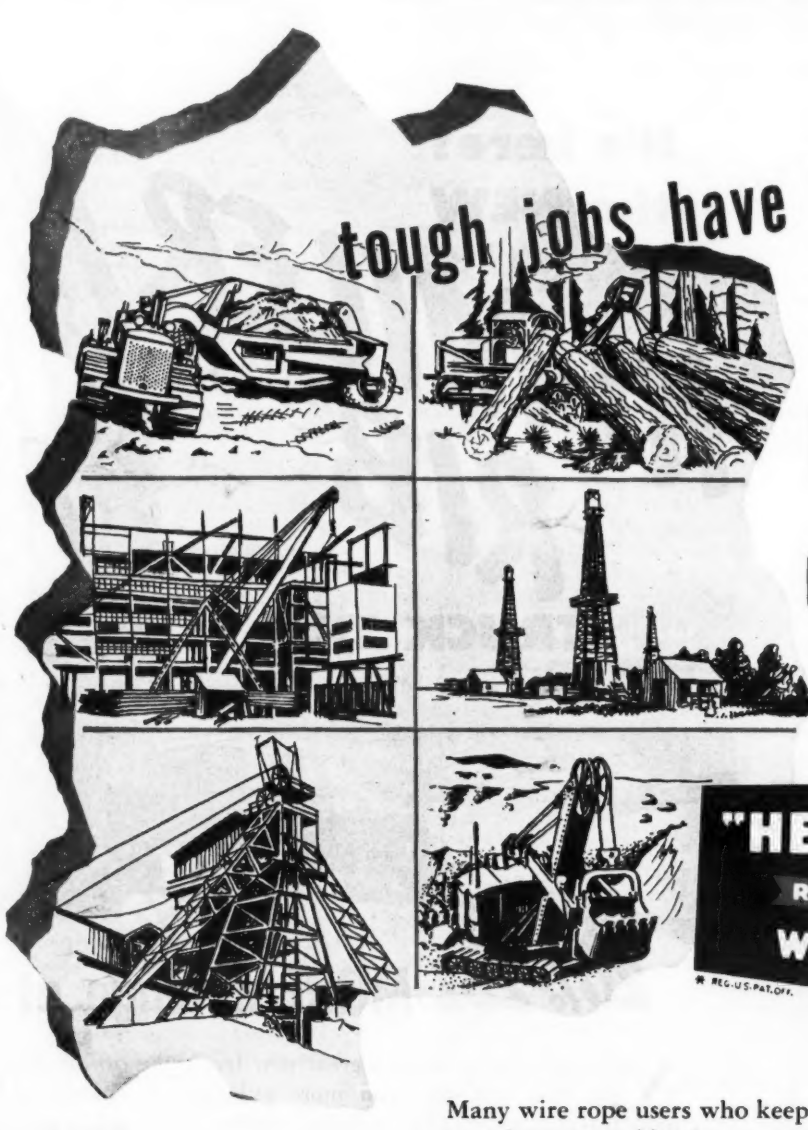

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tractors. Hauls did not exceed 500 feet, since the material was stockpiled for use later on the slopes as topsoil. A Lorain 80 dragline with a 55-foot boom and a Hendrix 2½-yard bucket dug the cut-off trench. The river silt, making up most of the excavation, was used as random fill in the embankment where possible.

The dragline was converted into a 1¾-yard shovel, and was put to work with a Northwest 2½-yard shovel in a borrow pit located on high ground about ¾ mile distant from the north end of the project. Impervious red glacial till was obtained there for backfilling the cut-off trench. Material for the dike was also obtained from two other borrow pits, likewise located outside the project limits. Two of the three pits yielded three different kinds of material—pervious, random, and impervious. In general the dike consists of gravel, sand, and glacial till. Material dug from the pumping-station ponds also went in the dike.

Most of the impervious material was hauled by 5 bottom-dump 13-yard Euclids over an average 1¾-mile one-way distance. Up to 30 trucks, contractor-owned and hired, averaging 7 yards a load, handled the rest of the embankment material on 2-mile average hauls. The trucks were used when the hauling was done over the highways. To keep the pavements clean from the droppings, an Austin-Western patrol sweeper worked up and down the road the trucks were driving over. Special policemen were also employed to regulate traffic where the haul roads intersected U. S. 5. Off-the-highway haul roads were maintained constantly by the three motor graders on the job—two Austin-Westerns and a Galion.

Compacted Embankment

Once the cut-off trench was backfilled, the embankment was built up in 6 to 9-inch lifts and compacted to get 95 per cent maximum density at optimum moisture by Proctor test. The material was spread by dozers and compacted by sheepsfoot rollers pulled by the tractors. Tractor equipment included 7 Internationals—3 TD-6's, 2 TD-9's, and 2 TD-18's; and 6 Caterpillars—4 D8's, 1 D6, and 1 D4. Eight sheepsfoot rollers—McCoy and Blaw-Knox—were on the job. Between lifts the fill was scarified slightly to bind the layers together better. This was done either by the motor graders or by a Clark Cutaway harrow pulled by a tractor. The smaller-size tractors operated well in the limited area on top of the dike, especially as the crown narrowed toward the top.

A standpipe was erected at each end of the job, tapping the city water supply, to serve the 5 water tank trucks which held 1,000 gallons each. These tankers wet the material down when it was dry coming out of the pits. Two of the tank trucks had gravity spraybars at the rear, while the other three were equipped with Gorman-Rupp 3-inch pumps to force the water out under pressure. At the rear of these trucks a 12-foot length of 8-inch pipe was hung parallel to the ground, and on each end a cylinder was attached by a wing nut. The water gushed through the pipe, down the cylinders, and onto a circular plate at the bottom which broke its force. Thus the water was concentrated satisfactorily, yet it did not erode the material. Hose were also hooked up to these tanks for wetting down in some locations.

C. & E. M. Photo
Job repairs on the West Springfield flood-control project were made from the contractor's traveling machine shop on a Chevrolet truck.

Other excavating equipment brought to the project included 2 other Northwest rigs—a 1½-yard shovel and a 1-yard dragline; a ¾-yard Koehring pull shovel on the landside toe trench; and a couple of Lorain truck cranes for laying pipe.

During the dirt work the stop-log structures were also built. Steel sheet piling was driven under these structures, and extended around to the cut-off trench. Driving was done with a McKiernan-Terry 9B3 hammer. During the construction of the dike, a 100-foot gap was left in the embankment as a safety valve to prevent damage to the partially completed dike by overtopping in case of a flash flood in the river.

Concrete Operations

In constructing the two pumping stations, the contractor used transit-mix concrete delivered to the job by the Valentine Concrete Co., Inc., of Springfield, Mass., after a 4-mile haul. Concrete was placed with crane and buckets. The foundation up to ground level was poured in Uni-Forms, while above that either ¾-inch sheathing or ½-

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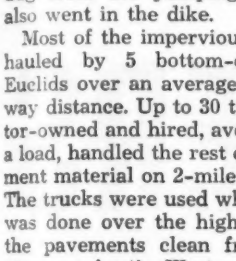

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This Hand Winch is ideal for moving and installing heavy machinery, loading trucks, hand derricks, cranes, gin poles, loading logs, sawed lumber, loading implements on trailers, hoisting silage, pulling wells, etc. Can be bolted anywhere and operated in any position. Made of electric steel; bronze bushed; 2 speeds, 8.16 to 1 for heavy loads.. 3 to 1 for fast operation ... self locking to hold loads at any position.

$30 LESS ROPE

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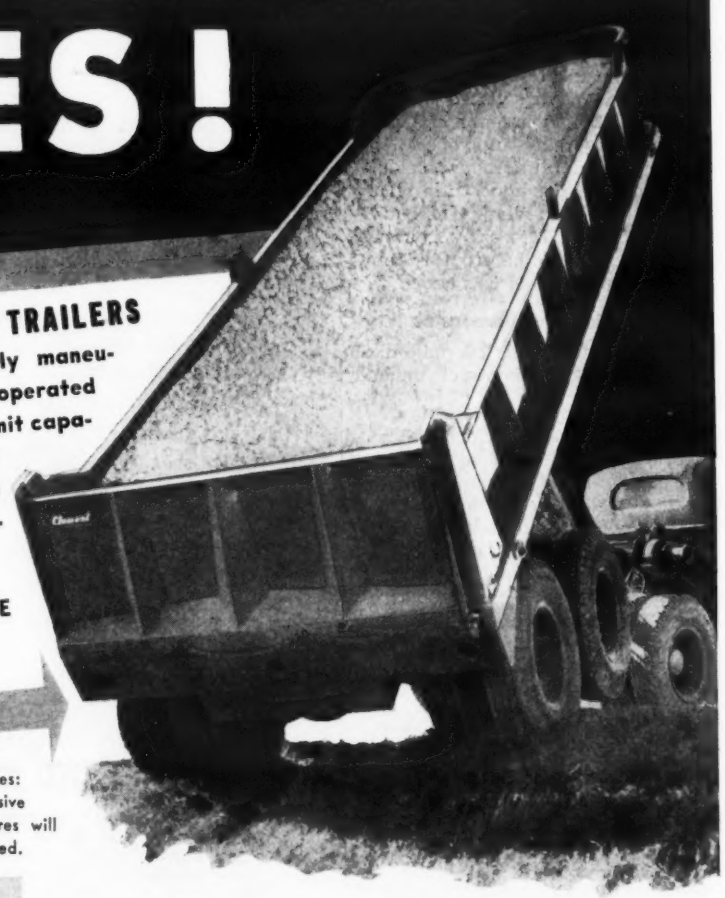

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Versatile and easily maneuvered, the cable-operated trailer is the only unit capable of dumping at this difficult angle with definite stability.

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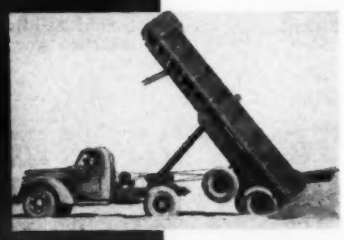

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WINCH-LIFT, INCORPORATED SHREVEPORT, LOUISIANA

Earth Dike Protects City Against Floods

(Continued from preceding page)

inch plywood was used. Truscon reinforcing steel and Universal form ties were employed throughout. Walls below ground are 18 inches thick generally, and the foundation slabs are 3 feet. Carpenters and concrete crews worked from Safway scaffolds during the construction.

Pipe for the project came from three different sources: concrete pipe from the New England Concrete Pipe Corp. at Springfield, Mass.; cast-iron pipe from the Warren Foundry & Pipe Co. at Boston, Mass.; and the clay pipe from Robinson Clay Products at Clearfield, Pa.

Job repairs were quickly made on the spot with the contractor's traveling machine shop—a Chevrolet truck with a closed-in body that contains a workbench complete with vises, grinders, small tools, etc. It also carries its own generating plant to run electric drills and lights, and an oxyacetylene burning and welding set. Spare parts for equipment are stored neatly in bins strung out along the sides, and at the rear the truck also tows on a trailer a Westinghouse electric welding machine.

The earth-moving equipment was fueled with Gulf products, and lubricated in the field from a grease truck. At the peak of the construction a force of 150 men was employed on the project, working five 11-hour days and an 8-hour day on Saturdays. The amount of dirt moved per day varied with the height of the dike. Excavation and hauling were run-of-the-mill operations, but placing of the fill became painstaking especially in the upper lifts where the dike narrowed in width. The equipment had to work in narrow confines, and each layer had to be properly compacted before more dirt was added.

Quantities and Personnel

The major items in the 2½-mile dike and pumping-station contract include the following:

Excavation, common	100,000 cu. yds.
Excavation, borrow	258,000 cu. yds.
Trench excavation	5,500 cu. yds.
Impervious fill	82,000 cu. yds.
Pervious fill	22,000 cu. yds.
Random fill	160,000 cu. yds.
Rock fill	2,500 cu. yds.
VC 8-inch toe drain pipe	3,000 lin. ft.
RC pipe, 15 to 42-inch	890 lin. ft.
CI pipe, 8 to 42-inch	577 lin. ft.
Concrete	1,700 cu. yds.
Reinforcing steel	236,600 lbs.
Topsoil	18,500 cu. yds.
Relief wells	48
Steel sheet piling	9,200 sq. ft.

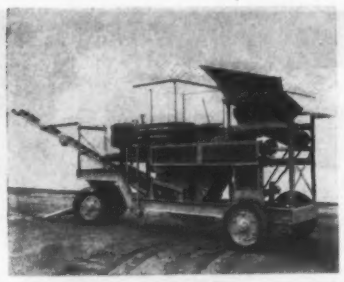
Dick Ahearn is Superintendent on the project for Daniel O'Connell's Sons, Inc., of Holyoke, Mass.

For the Department of the Army, Corps of Engineers, Everett J. Steed is Resident Engineer. The New England Division of the Corps of Engineers, with headquarters at Boston, is headed by Lt. Col. G. W. Carlson, Acting Division Engineer. C. J. Murray is in charge of the Construction and Operations Division.

Single-Pass Plant Crushes and Screens

A new Cedarapids single-pass crushing and screening plant has recently been built by Iowa Mfg. Co., Cedar Rapids, Iowa. Made up of standard Cedarapids units, the new plant is recommended by the company for use where material is screened into only one size. Highly mobile, it can be set up close to the job site to eliminate high hauling costs and provide a source of gravel and rock for road maintenance work or small construction jobs. Low operating costs and maintenance are claimed to be the result of simple design.

The single-pass plant consists of a reciprocating clutch-controlled feeder and a 6 x 6-foot charging hopper with adjustable rate of feed; a 24-inch x 3-foot single-deck horizontal vibrator screen; a Cedarapids jaw crusher with a choice of 10 x 16, 10 x 20, or 10 x 24-inch jaw openings; and a 25-foot delivery conveyor. All units are mounted on a steel-wheeled or pneumatic-tired truck. Use of a Cedarapids twin jaw crusher instead of a single jaw crusher is recommended by Iowa where there is an unusually high percentage of large gravel.



Iowa Mfg. Co. designed its new single-pass crushing and screening plant for maintenance and construction jobs where material is screened into only one size.

Further information may be secured from the company by requesting Bulletin SPP-1. Or use the Request Card at page 16. Circle No. 11.

Weed Cutter and Sprayer

A mobile powered unit for cutting and spraying weeds is highlighted in a new 4-page folder issued by Jari Products, Inc., 2938 Pillsbury Ave., Minneapolis 8, Minn. The dual unit "cuts 'em down or sprays 'em dead", the catalog says.

The Jari is a powered scythe designed for cutting weeds in large areas or in hard-to-get-at places. The knife blades project 12 inches on each side and can be offset another 10.

The folder gives directions for the quick change from cutter to sprayer with the spray attachment, a 10-gallon self-propelled rig which covers a swath 2 to 14 feet wide and develops 130-psi pressure. A 25-foot hose and spray boom help to get at trees or around-the-corner spots, the catalog says.

Applications, features, specifications, and field photographs are included in this bulletin. It may be obtained from the company, or by using the Request Card at page 16. Circle No. 3.

GREAT GRADERS . . .

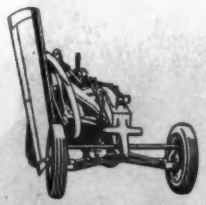
THERE'S no guessing about the performance of "Cat" Diesel Motor Graders with John S. Pukrop, Contractor, Ivanhoe, Minnesota. He knows from experience that these husky yellow machines deliver 60-minute hours day after day. And that's half the battle in figuring and making profits on a job.

Here you see his "Cat" Diesel No. 12 Motor Grader busy on Pipestone County Highway No. 4 near Ruthton, Minn. Right on the heels of rough grading, it's finish grading 9.5 miles of 30-ft. highway. There's no time lost making repeated passes – the No. 12's positive controls keep the tough blade on the beam. But let's get the overall picture directly from Mr. Pukrop, who says: "In my book the No. 12 is the best of all graders and most economical to operate. It has many uses, of course, but we use it for grade finishing. Two miles per 10-hour day is the average, but it could do more if the rough grade was far enough ahead. 'Caterpillar' machines are by far the best on the market."

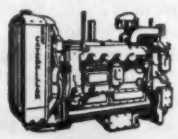
Whatever the grading job, there's a "Cat" Diesel Motor Grader the right size to do it most efficiently and economically for you. And there's a capable "Caterpillar" dealer near-by who's ready round the clock to give you "Johnny-on-the-spot" service. He sincerely believes this rugged yellow machine is the best in the field. Ask him for full proof of its performance!

CATERPILLAR TRACTOR CO. • PEORIA, ILLINOIS

Only **"Caterpillar" designs and builds *every* part of the famous "Cat" Motor Graders. This undivided responsibility is your assurance of a long life of efficient, economical performance.**



Each of the 3 sizes of "Cat" Motor Graders is a completely different machine. There's no performance penalty due to *excessive frame weight*, too little power or poorly matched working parts.



Only **"Caterpillar" Motor Graders have the dependable yellow engines—the power plants that are world famous for delivering 60-minute-hour performance every hour day in and day out.**

Lubricating oil is cooled in this radiator section to minimize carbon lacquer and gum formations — enemies of long engine life. Lower temperatures preserve the lubricating qualities of the oil.

Safe and sure Diesel starts are assured by this electrically started gasoline engine. It warms the coolant and allows the Diesel to circulate "lube" oil before actual starting.

Castings like this cylinder head on "Cat" Diesels are made right in "Caterpillar's" own foundry, where tolerances and quality can be closely controlled — another example of precision engineering!

CATERPILLAR

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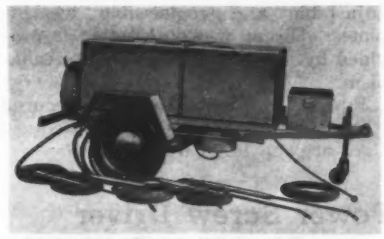
ENGINES • TRACTORS • MOTOR GRADERS

For Heat Transfer And Steam Cleaning

The Super-Duty Hypressure Jenny steam cleaner, designed and built to do big cleaning jobs, and also for heat-transfer uses, has just been announced by Hypressure Jenny Division, Homestead Valve Mfg. Co., Coraopolis, Pa. Said to be 48 to 60 times faster than hand methods, the new unit has a 300-gph capacity and will operate from one to four cleaning guns. Full operating pressure is reached within 2 minutes from a cold start, according to the company.

The Jenny can be changed over for use as a heat generator with heat output equivalent to a 25-hp boiler; the change is completed by loosening two bolts and reversing the crank arm. The cleaner is made in trailer-mounted, portable, and stationary models. Standard equipment on all models includes one ½-inch Hypower cleaning gun, one 25-inch length each of ½ and ¾-inch vapor hose, and a choice of either gasoline engine or 1-hp electric motor. Weighing approximately 1,600 pounds, the unit measures 48 inches in width x 44 inches in height, and varies in length from 78 to 132 inches depending upon the model chosen.



As a steam cleaner, the Super-Duty Hypressure Jenny has a 300-gph capacity. As a heat generator it is equivalent to a 75-hp boiler.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 33.

Syntron Sets Up on Broadway

Syntron Co., Homer City, Pa., manufacturer of vibratory handling equipment, portable power tools, and allied items, has moved its New York sales and engineering office from Long Island City to 1860 Broadway, New York City 23.

A Slide Calculator For Plywood Forming

A new slide rule calculator to facilitate design and construction of plywood forms has been announced by the Douglas Fir Plywood Association.

Known as the Keely Plyform Calculator, it is designed to provide quick, easy data for specification use on proper plywood thickness and on the spacing and size of studs, wales, and ties—based on hourly rate of pour. Operated as a slide rule, it calculates for vibrated and unvibrated concrete at both 50 and 70 degrees F.

Developed by Hal Keely, head of a Pittsburgh, Pa., plywood-distributing firm, the calculator is a new and improved version of a similar instrument which was introduced to panel users and specifiers before the war. The calculator was prepared by M. L. Elkins, registered professional engineer of Richland, Wash.

Measuring 3 x 8 inches, the calculator is printed on durable plastic. Included with it is a small folder of design assumption by Elkins. Copies of the Plyform Calculator and a folder of design assumptions are available at $1.00 per instrument from the Douglas Fir Plywood Association, Tacoma 2, Wash.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 112.

Air-Entraining Agent

A new 12-page bulletin about Ayr-Trap, an air-entraining agent for concretes and mortars, has recently been prepared by A. C. Horn Co., Inc., 10-10 Forty-Fourth Ave., Long Island City 1, N. Y. This technical release describes the properties of Ayr-Trap and the results of tests comparing standard and air-entrained mixes. It points out improvements in the physical properties of concrete that are possible by the addition of ½ ounce of Ayr-Trap per bag of cement. The concentrated formulation of the product accounts for the small amount of Ayr-Trap needed per bag of cement, the company says.

In treating the significance of air entrainment, the bulletin explains that the air bubbles are disjointed and microscopic; in the mix they may be considered an additional aggregate; they impede the flow of water through the concrete as effectively, in many respects, as would an equal volume of solid material. Some features the bulletin claims for Ayr-Trap: reduction in the quantity of gaging water required, greater plasticity, minimum bleeding and segregation, and increased resistance to spalling and flaking.

The tables given in the bulletin indicate the effect of variation in the amount of Ayr-Trap on compressive strength and freezing-thawing resistance, the effect of cement and sand content on entraining properties, and the effect of consistency and mixing time on entraining properties.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 4.

General-Purpose Hoists

Two new catalogs covering the line of American general-purpose hoists are announced by American Hoist & Derrick Co., 63 S. Robert St., St. Paul 1, Minn. Both catalogs are illustrated with on-the-job photos, as well as close-ups of mechanical parts and assemblies, and give detailed descriptions and full specifications for all models. Catalog No. 100-H-40 covers American general-purpose hoists from 5 to 40 hp. Catalog No. 100-H-55 covers American hoists from 50 to 100 hp.

This literature may be obtained from the company or by using the Request Card at page 16. For Catalog No. 100-H-40, circle No. 144. For Catalog No. 100-H-55, circle No. 145.

...and here's the proof!

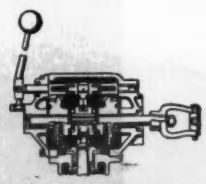
This "Cat" Diesel No. 12 Motor Grader is one of the fleet of "Caterpillar" equipment owned by John S. Pukrop, Contractor, Ivanhoe, Minn. Other big yellow machines include five D8 Tractors, two D7 Tractors, a DW10 wheel-type Tractor and No. 10 Scraper.

Typical of "Caterpillar" quality are these aluminum alloy pistons. Tops are oil sprayed for coolness and long life. Cast iron compression-ring belt keeps this vital ring working at top efficiency.

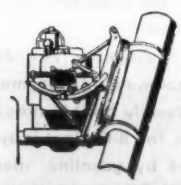
"Caterpillar"-built fuel injection equipment is trouble-free and fool-proof. Injection capsules and pumps can be replaced on the spot in the field — no adjustments are necessary.

Exclusively "Caterpillar," these solid aluminum "con" rod bearings give low rate of wear, ability to carry heavier loads, exceptional heat transfer characteristics and high corrosion resistance.

"Caterpillar" Motor Graders are designed for exceptionally good operator visibility. Sitting down, the operator can see toe and heel of the blade with equal ease. That helps keep jobs moving.



Mechanically operated controls give the user the constant control that is so necessary for precision work. They're quality built — changes in temperature do not affect them.



"Caterpillar's" exclusive side-shift mechanism allows extreme blade positions without the need for manual adjustment of linkage. You'll find this a real work- and time-saver on the job.

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EARTHMOVING EQUIPMENT

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The Unit 614 is a ½-yard excavator convertible to all attachments. It has a crane capacity of 6 tons at a 12-foot radius.

Half-Yard Excavator With 6-Ton Capacity

A new addition to the line manufactured by the Unit Crane & Shovel Corp., Milwaukee 14, Wis., is the Unit 614, a ½-yard excavator convertible to all attachments. Its crane capacity is 6 tons at a 12-foot radius. A General Motors diesel and a Chrysler 8-cylinder industrial gasoline engine are standard power installations for the new machine.

The 614 has an improved hook-roller design, according to the company. Twin hook rollers are equalized and mounted on the front and rear of the rotating frame, and are quickly adjusted by an eccentric pin. There are 4 upper load rollers plus 4 hook rollers. All rollers are conical and made of drop-forged steel. The car body and roller path are a rigid one-piece alloy-steel casting bolted to the axles and crawler frame. Deeper and longer crawler side frames are designed to give better support to the end bearings. The lower traction gears are completely enclosed and run in a constant bath of oil. The live shafts in the lower structure are splined. Involute-splined shafts are used throughout the entire upper-structure mechanism.

Automatic traction brakes provide an internal-expanding friction-type locking device for both crawlers. Engaged and released automatically, they give traction lock without the necessity of manual control, according to the manufacturer. The dipper stick is a single rigid structural section, sliding through a heavy cast-steel saddle-block, with adjustable and replaceable wearing plates. Direct crowding action is provided by the Unit chain-crowd mechanism.

Further inforamtion may be secured from the company. Or use the Request Card at page 16. Circle No. 106.

Power Screw Driver Fits Any Drill Size

The new Bull Driver, manufactured by the Bertram Engineering Co., 3121 Main St., Kansas City, Mo., enables automatic power screw driving from any electric drill or drill press. This unit, the company says, fits the chuck of any electric drill or drill press and can be attached quickly and simply. It automatically centers on the screw groove. Release, too, is automatic; the driver disengages itself when the screw is firmly home in wood or metal.

Casing of the Bull Driver is of light aluminum. The heavy sleeve bearings are sealed and self-lubricating. The unit comes in three models: a self-centering model for small machine screws, a self-centering model for driving up to No. 14 screws, and a hand-centering model.

The Bull power screw driver fits the chuck of any electric drill or drill press and automatically centers on the screw groove. Three models are available.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 91.

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MODEL TMH CONVERTED

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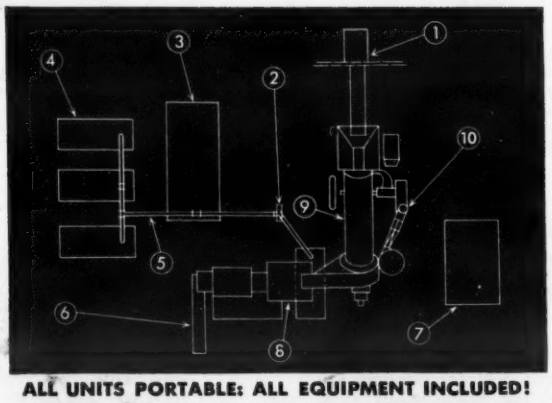
It comes to you complete, with all parts clearly marked for easy assembly.

All units are portable, and the main units—Mixer and Dryer—are mounted on pneumatic-tired chassis. All components are sturdily built to require minimum maintenance.

Once set up, the B-G Plant is operated by as few as three men. Powered by gasoline, diesel, kerosene engines, or electric motors. Write for further information on its capacity, portability and ease of operation, giving data on the type of work you have in mind.



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Dual 7-Mile Highway Graded in Fast Time

Florida Adds a New Section To 4-Lane Road North of Miami; Long Fills Built With Borrow-Pit Material

✦ THE Florida State Road Department has completed grading a 7-mile section of superhighway that is a continuation of NW 27th Avenue leading out of Miami to the north. Known as State Route 9, the project is located in Dade County. It begins at Opa Locka, a suburb of Miami, and continues in a northeasterly direction to the Broward County line.

Only grading was included in this contract that the Road Department awarded to the H. E. Wolfe Construction Co. of St. Augustine, Fla., on its low bid of $589,000. Paving is expected to be done next year. The major item for the stretch of dual-lane roadway was 742,415 cubic yards of excavation that was taken chiefly from borrow pits. The long shallow fills that marked the job were constructed from the material thus obtained.

The contractor started work on January 5, 1949, and had 390 calendar days in which to finish. With dry weather prevailing throughout the winter months last year, excellent progress was made with the earth work. In March the peak of production was reached when 200,000 yards were placed in the embankments. Consequently the job was completed in August, well ahead of schedule.

Superhighway

The superhighway out of Miami, of which this contract was a continuation, runs north from NW 36th Street on NW 27th Avenue. The first 6 miles were completed in 1948 as far as Opa Locka by R. H. Wright & Son Co. of Fort Lauderdale, Fla., at a cost of around $1,000,000. This part of the project is a municipal section consisting of two 24-foot black-top pavements separated by a 14-foot grass dividing strip enclosed by curbing. Along the outside edge of the paving is an 8-foot paved parking lane, also black-top, with curb and gutter along the edge.

While no base course or paving was included in this new 7-mile extension, there will eventually be a 4-lane pavement consisting of two 24-foot paved strips separated by a depressed grassed median strip, from 10 to 64 feet wide, on a right-of-way 200 to 300 feet wide. At the outer edge of the pavement there will be 8-foot shoulders sloping ¾ inch to the foot. With the exception of a 50,000-yard cut at the north end, which was only 2 to 3 feet deep, the job was all fill, with the embankments averaging from 6½ to 7 feet high.

On fills up to 6 feet in height, the side slopes are 6 to 1. On 6 to 10-foot fills the slopes are 4 to 1; and for any fills over 10 feet high, the side slopes are either 1½ to 1 or 2 to 1. At the south, or lower end of the job, some muck was encountered 1 to 3 feet in depth. This was removed, and the hole was backfilled with borrow-pit material.

Railroad Alignment

The 7-mile project starts at the eastern end of Opa Locka, and swings away from NW 27th Avenue to follow a line to the northeast over new location. It closely parallels the tracks of the Sea-

(Continued on next page)

C. & E. M. Photo

In the south borrow pit available for the Florida road-grading job, a Lorain 75-D dragline loads a bottom-dump Euclid with 15 yards of material.

SPEED-UP CONSTRUCTION

The Danuser Digger Attachment for most popular tractor makes is built for rugged jobs. Digs holes fast, straight, automatic—500 to 600 per day. One-man operation—augers 4" to 24". Write Dept. D.

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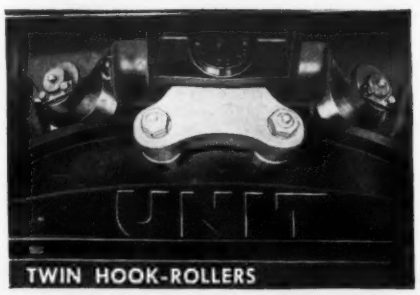
NEW SHOVEL ATTACHMENT

Shovel boom is a heavy weldment with sturdy box-section side members. Cast-steel hinges give added strength to boom foot. Dipper-stick is a single, square structural steel section. The cast-steel saddle-block is lined with adjustable and replaceable wear-plates. Direct crowding action is provided by the UNIT chain-crowd mechanism, eliminating cables, racks and pinions. A special equalizer insures even pull on both strands of the double crowd-chain.



TWIN HOOK-ROLLERS

Twin hook-rollers are equalized and mounted on the front and rear of the rotating frame. Quickly adjusted by means of eccentric pin. There are 4 upper-load rollers plus 4 hook-rollers. All rollers are conical shaped and made of drop-forged steel.

The completely new UNIT 614 — ½ yard offers the same rugged construction usually found only in machines of greater capacity. Twenty-five years of engineering skill and craftsmanship have gone into the production of this model — an outstanding product resulting from specializing in sizes under one yard. Compare its construction features and design with any ½ yard machine in the market today. We are confident that your judgment will favor the UNIT 614.

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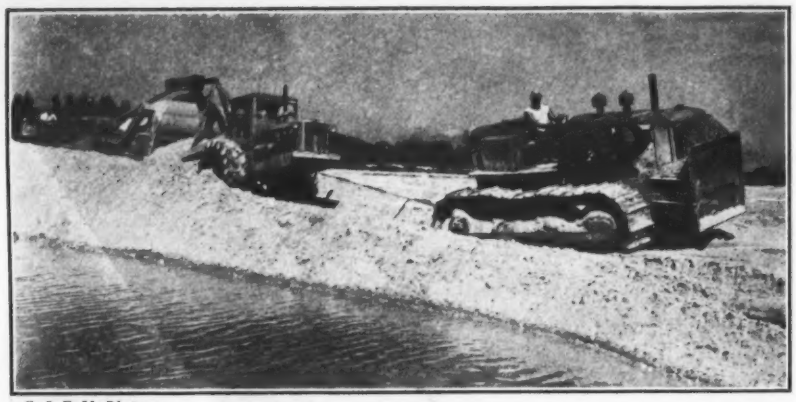


C. & E. M. Photo

In borrow pit No. 2 at the north end of the Wolfe grading contract, a Super C Tournapull with an LP Carryall is loaded with 12 yards of material. An Allis-Chalmers HD-19 snatch tractor pulls the rig, while a Caterpillar D7 tractor pushes.

Dual 7-Mile Highway Graded in Fast Time

(*Continued from preceding page*)

board Air Line Railway, employing long tangents over the flat, open country. At the north end, the superhighway ties in to the Broward County line; it is planned to continue it to the north.

Two bridges were included in the contract, each with dual 28-foot roadways. One bridge, over Biscayne Canal, is 198 feet long, while the other over Snake Creek is 132 feet long. They are of similar construction with reinforced-concrete superstructures supported on 12-inch steel H-pile bents with 33-foot spans. The steel H-piles are encased in concrete to a point 3 feet below the water line. The construction of the bridges lagged behind the grading, but they were not needed for hauling purposes since borrow pits were available at both ends of the job.

One pit covering some 17 acres was about 1½ miles north of the lower end of the job. The other and larger, approximately 22 acres in size, was located 2 miles south of the north end of the project. Both were just off the right-of-way. Sand was obtained for the most part from the north pit which yielded about 150,000 yards. The south pit produced a good mixture of lime rock and sand after a 3-foot overburden of unsatisfactory muck and marl material was stripped from the top. About 400,000 yards of material was obtained from the south pit. It was already stabilized when placed on the roadbed, and the mixture tested to a bearing capacity of 50 pounds per square inch.

Equipment at Work

Where muck was found on the alignment, it was removed for a width of 150 feet across the roadbed, well beyond the limits of the shoulders. The average depth was 1½ to 2 feet, with a maximum of 5 feet in places. The backslopes to grade at the edges of the muck excavation were always 1½ to 1. As the draglines cast it out, the muck was stockpiled for use later on the slopes.

In the south pit, where the lime rock and sand borrow were obtained, the material was dug out by a Northwest dragline equipped with a Page 2-yard bucket, and heaped into a windrow at the side of the pit. Ground water was encountered after digging into the ground only a foot. As the depth of pit averaged 16 feet, the presence of this great amount of water was a serious problem. The contractor solved it by using a 24-inch canal pump, a type that is used for irrigation work in the lower Florida peninsula.

The pump had a capacity of 10,000 gpm, and was kept in operation 24 hours a day for 7 days a week. It kept the water level of the pit down 2 feet below what could be expected. As a result the draglines worked on dry land, digging holes about them on three sides. Naturally the material was wet as it was cast out, but it was allowed to remain in the windrow for a couple of days to dry out. Then a Lorain 75-D dragline, with a 50-foot boom and a Hendrix 1¾-yard bucket loaded the borrow into the hauling equipment.

Worked Two Shifts

From this borrow pit the material was hauled in a fleet of 6 bottom-dump Euclids averaging 15 yards a load. The draglines worked two 10-hour shifts every day at this phase of the job, in order to have enough borrow on hand to keep the hauling units busy. For illumination, 3 Caterpillar 15-kw light plants and 2 Kohler 5-kw light plants were strung out over the borrow pit and on the roadbed where the fill was being placed. As the pit was opened up parallel to the road, the average haul with the Euclids was 3,000 feet, while over 2 miles of roadway was actually built from this one pit.

At the north pit where the sand was obtained, the borrow was taken out with 5 Super C Tournapulls hooked to LeTourneau LP Carryalls that averaged 12 yards a load. In the heavy sand going, these units were snatch-loaded by an Allis-Chalmers HD-19 tractor pulling with a cable, while at the same time a Caterpillar D7 tractor was pushing. The average haul with the Tournapulls was 2,000 feet. From this long spread-out pit, material was obtained for 2½ miles of roadway. There was practically no dead hauling of material on the job.

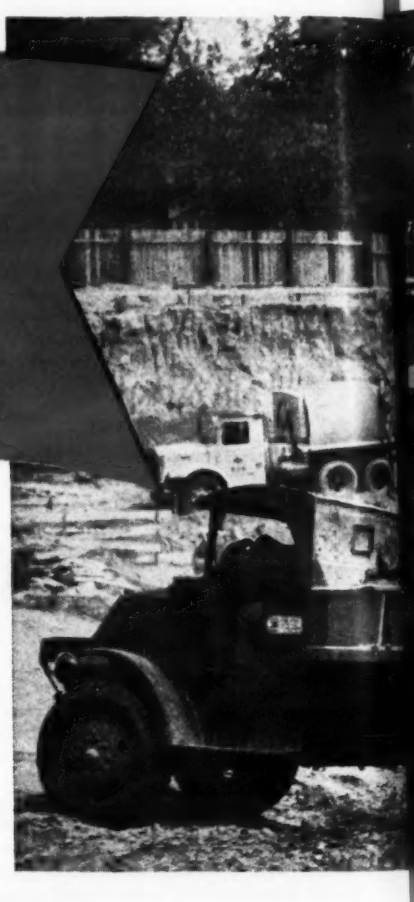
The excavations at the north pit were kept to a maximum of 6 feet so that no pumping was required. About two-thirds of the yardage was taken out dry by the Tournapulls, while the remaining one-third that was wet was cast up by the draglines into a windrow. Dozers flattened out the top of the windrow; and as the sand dried, the Tournapulls loaded by running along the top, scooping up the borrow as they went.

Scrapers on Short Hauls

For work along the roadway on short hauls up to 1,500 feet, three LeTourneau Carryalls of 24, 16, and 12-yard capacity were employed. All were pulled by Caterpillar D8 tractors. All material was placed in 6-inch lifts on the fills, and compacted both by the hauling equipment and by a LeTourneau sheepsfoot roller pulled by a D7 tractor. Two 1,500-gallon water tank trucks with spraybars

(*Concluded on next page*)

SURE WAY TO REDUCE UPKEEP COSTS



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TEXACO

TEXACO

at the rear were on the job to wet the fill, but they were seldom used since the borrow pits were so wet naturally.

The roadbed was shaped by two Caterpillar No. 12 motor graders. The final dressing of the ditches was done by an Adams pull grader towed by a D7 tractor.

Standard Oil diesel fuel was supplied to the job by the Bowden Oil Co. of Miami which filled a 20,000-gallon storage tank located at the contractor's shop, halfway along the project. Two 650-gallon tank trucks distributed the fuel to the equipment out in the field. A grease truck greased each unit twice a day.

Quantities and Personnel

The major items in the 7-mile superhighway grading contract included the following:

Clearing and grubbing	209 acres
Excavation	642,415 cu. yds
Muck excavation	88,433 cu. yds.
Concrete	1,537 cu. yds.
Reinforcing steel	266,006 lbs.
Steel piling, 12-inch H 53-pound	6,000 lin. ft.
Concrete-pipe culvert, 18-inch	1,266 lin. ft.

From 45 to 60 men were employed on the project by the H. E. Wolfe Construction Co. of St. Augustine under the direction of Superintendent Jack Nichols; J. F. Westbrook and E. E. Curtis were Grading Foremen.

F. E. Cullum, Senior Project Engineer, supervised the construction for the Florida State Road Department which is headed by Alfred A. McKethan, Chairman. Sam P. Turnbull is State Highway Engineer.

New Hot-Mix Plant Has One-Man Control

A new continuous-mix bituminous plant has recently been announced by Wayne Crane Division, American Steel Dredge Co., Inc., 2000 Taylor St., Fort Wayne, Ind. Known as the Wayne Monotrol Model M-20, it is designed for one-man control and is said to have a capacity of 20 tons per hour. The entire plant is built in sections which are easily assembled and disassembled on the job. The largest single unit weighs 3,000 pounds. All functions of the plant are electrically operated from a single control panel.

The Wayne Monotrol Model M-20 hot-mix plant has a capacity of 20 tons per hour and features positive control of the quality of the mix.

Positive control of the quality of the mix is the most important feature of the new machine, according to Wayne. An individually controlled volumetric-type feeder valve for each compartment of the raw-aggregate bin permits accurate proportioning in any specified percentage. A three-section rotating drier is designed to prevent segregation and can, it is said, eliminate up to 100 per cent of the moisture if required. It is equipped with baffles, dams, and stops to mix the aggregate thoroughly as it drops from the top of the drier. The percentage of moisture content removed is regulated by the rotating speed of the drier.

The feed screw of the bin is actuated by a variable-speed transmission. An indicator dial shows the operator the amount of aggregate moving into the pugmill, while an electric speed control to the bitumen pump permits constant control in mixing any specified proportions. The variable-speed transmission makes it possible to change the flow of the aggregate while the machine is in operation.

Thorough coating of the aggregate in the pugmill is provided by the action of a cut-type rotary mixing screw. Additional mixing results from the 5-degree elevation of the discharge end which produces a backward rolling motion as the aggregate travels through the mill.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 49.

Procedure and Practice Of Electric Arc Welding

In its new 544-page book called "Electric Arc Welding", The Hobart Trade School, Inc., Box EW-146, Troy, Ohio, has made available a comprehensive and practical textbook on arc welding, which is of value not only for the student, but also for the welding engineer, welding operator, and designer.

The 28 chapters are grouped in five parts: (1) general information; (2) operator training course; (3) carbon arc welding and cutting; (4) other welding processes; (5) welding terms and their definitions.

Part 1 discusses the development of electric arc welding, describes applications, available metals and alloys, joints and welds, electrodes, equipment, and basic procedures. Part 2 constitutes a complete self-study course, incorporating review summaries, practical exercises, and quiz questions. The third part describes in detail the principles and practical operations of carbon arc welding. Part 4 covers other welding processes such as inert-gas-shielded arc welding, submerged arc welding, and electric stud welding. The last part reproduces the welding terms and their definitions approved by the American Welding Society.

The textbook is illustrated with over 600 photographs, diagrams, and charts. It costs $3.00.

EVEN the roughest service won't pound or squeeze *Texaco Marfak* out of chassis bearings. This famous lubricant assures protection against wear and rust for extra hundreds of miles. *Texaco Marfak* saves parts replacements, keeps equipment on the job and out of the repair shop. And because *Texaco Marfak* is so long lasting, fewer applications are needed—another saving.

In wheel bearings, use *Texaco Marfak Heavy Duty*. It seals out dirt and moisture, seals itself in—assuring safer braking. Bearings last far longer because they get full protection. *Texaco Marfak Heavy Duty* requires no seasonal change.

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New Gasoline Plant Is Built in Louisiana

Absorption-Type Unit Erected Over Pipe Line Which Taps Oil Fields Along Gulf Coast

By WILLIAM H. QUIRK,
Eastern Editor

(*Photo on page 1*)

✦ THE Humble Oil & Refining Co., of Houston, Texas, has added another gasoline plant to its system near Opelousas in south-central Louisiana. The new construction was started in October, 1948, and was completed by November 1, 1949. The plant was designed and built for the oil company by the Hudson Engineering Corp., of Houston.

The plant is ideally located on State Route 5 about 3 miles south of Opelousas, and one property line is only 300 feet off the main north-south line of the Southern Pacific Railroad. It straddles a 16-inch pipe line of the Interstate Natural Gas Co. that runs from the oil fields on Pecan Island in Vermilion Parish along the Gulf Coast, to the big refineries at Baton Rouge. The new plant is about 70 miles from the source of natural gas, and about 60 miles west of Baton Rouge.

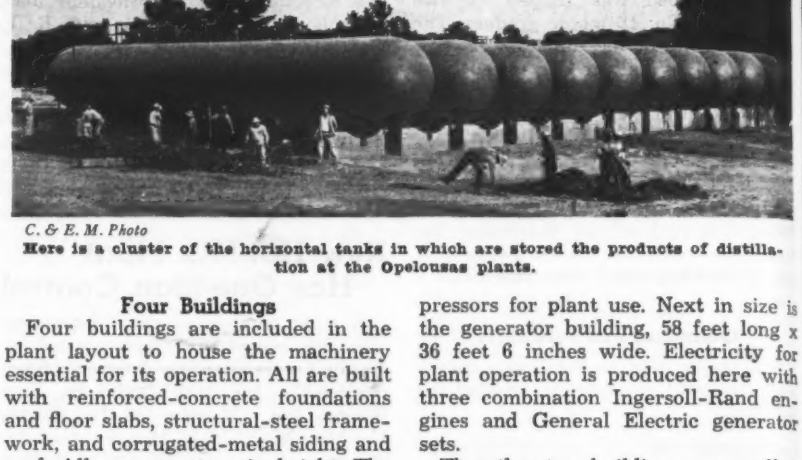
The plant itself is built on a 53-acre site, with an additional 12 acres to the north reserved for a housing community of fourteen cottages. Here will live the 25 to 35 permanent employees of the plant after it goes into operation. A deep well supplies water for the camp, and storage is provided in a 21,000-gallon steel tank mounted on a 60-foot steel tower.

Absorption-Type Plant

Wet gas passes through the pipe line under the new plant. This absorption-type plant processes the gas and returns it dry, stripped of recoverable hydrocarbon, to the pipe line whence it proceeds eastward to Baton Rouge. The various hydrocarbon products, such as gasoline, butane, propane, etc., that result from the processing, are stored at the plant in tanks for distribution via either railroad tank cars or tank trucks.

The main part of the plant is the distillation area where eight big steel absorber and process units are located. From the pipe line the wet gas goes directly to the main tower in this group where the processing begins. These steel shells are supported on reinforced-concrete foundations which extend, in some places, 6 feet below the level of the ground. All concrete was mixed at the site in two-bag mixers, and placed in wooden forms. The footing excavations were dug by a tractor-dozer.

Heavy tank sections were erected by two derricks with vertical masts 95 feet tall, which were secured to the ground by four guy lines. The pieces were assembled on the ground at the foot of the mast by an International truck equipped with an A-frame and a Tulsa winch.



C. & E. M. Photo
Here is a cluster of the horizontal tanks in which are stored the products of distillation at the Opelousas plants.

Four Buildings

Four buildings are included in the plant layout to house the machinery essential for its operation. All are built with reinforced-concrete foundations and floor slabs, structural-steel framework, and corrugated-metal siding and roof. All are one story in height. The largest, the compressor building, is 92 feet long x 26 feet 6 inches wide. It contains four Cooper-Bessemer compressors for plant use. Next in size is the generator building, 58 feet long x 36 feet 6 inches wide. Electricity for plant operation is produced here with three combination Ingersoll-Rand engines and General Electric generator sets.

The other two buildings are smaller. The pump house is 24 feet long x 22 feet 6 inches wide, while the chlorina-

(*Concluded on next page*)

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tor building measures 8 feet x 8 feet 6 inches. Water is obtained from two wells, 400 feet deep; only one is used at a time, the other serving as a stand-by. The main water tank at the plant is of all-welded steel construction. It stands 35 feet high, has a 61-foot diameter, and holds 210,000 gallons.

Big Welding Job

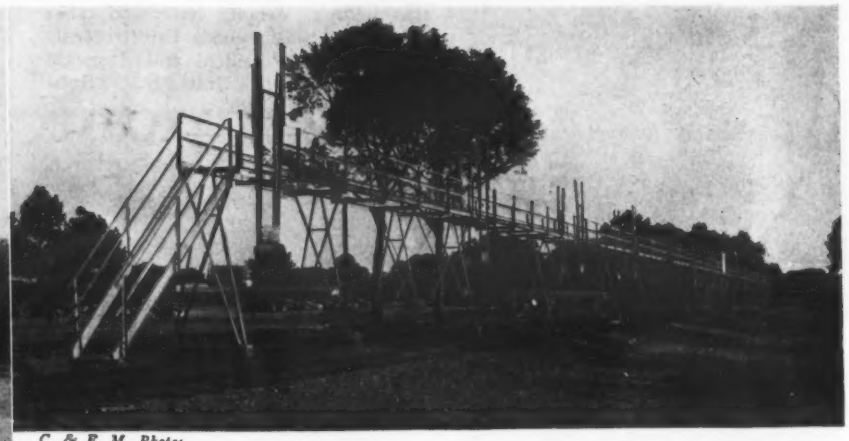
The products derived from the plant processing are stored in numerous tanks grouped around the site on concrete foundations. One cluster of horizontal tanks, into which will be piped the products of the distillation, consists of 15 units, holding from 700 to 1,000 barrels each. Another group is made up of five vertical storage tanks holding 1,000 barrels each. The multiplicity of tanks of steel welded construction, together with the thousands of feet of pipe common to all gasoline plants, entailed considerable welding. Every length of pipe 2 inches or larger in diameter was welded; smaller-size pipe was screwed together. Pipe welding was done with Lincoln 200-amp welders; from 15 to 20 machines were generally in use throughout the work. The usual procedure was to assemble the pipe and weld as much of it together as possible before installing it in place. The welding was done under sheds with open sides.

For distributing the products of the plant a steel loading rack was constructed with a railroad track along each side. The rack is 650 feet long and can accomodate a total of 30 tank cars, 15 to a side. A double-track spur connects the rack with the near-by main line of the Southern Pacific. Altogether 2,000 feet of track was laid to serve the plant. Pipes from the various storage tanks are laid on the ground underneath the elevated loading rack. At regular intervals risers are tapped in, extending up to the floor of the long platform to feed the tank cars.

There is also a truck loading rack at which two tank trucks can be loaded at the same time. Rail and highway transportation is thus readily available. The plant is only 21 miles north of U. S. 90, the principal east-west highway that serves the Gulf Coast states. It is also convenient to the system of inland waterways in southern Louisiana.

Personnel

During the peak of the construction the Hudson Engineering Corp. employed between 200 and 225 men under the direction of E. C. West, Superintendent.



C. & E. M. Photos

Concrete footings support tanks in the distillation area of the Opelousas gasoline plant (left). A steel loading rack (above) erected between two tracks can accommodate 30 tank cars for distributing the products of the plant.

USBR Concrete Manual

An improved fifth edition of the Bureau of Reclamation's "Concrete Manual" is now available for distribution.

New subject matter includes instructions on the use of air entrainment in concrete and data on the occurrence and use of pozzolans and their effects on concrete. Information on the occurrence of alkali-aggregate reaction in concrete and means of preventing concrete deterioration has been expanded. New procedures are described for concrete repair, for sampling sealing compounds and mastic joint fillers, and for determining the air content of concrete.

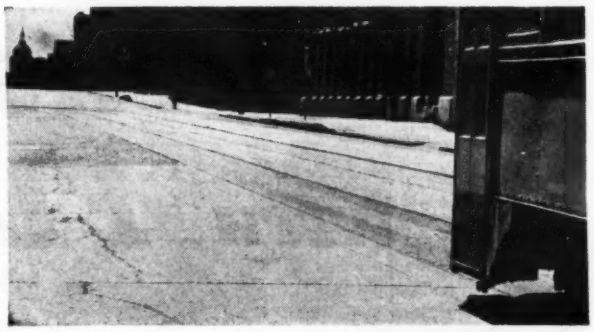
Engineers of the Branch of Design and Construction at Denver prepared the manual, working under the direction of L. N. McClellan, Chief Engineer of the Bureau. It contains 489 pages and 167 illustrations. Copies are available at $1.75 each from the Superintendent of Documents, United States Government Printing Office, Washington 25, D. C.; or from the Bureau of Reclamation, Denver Federal Center, Denver, Colo.

Now!

BUY used equipment
SELL used equipment
ACQUIRE competent personnel

thru

THE TRADING POST, CONTRACTORS & ENGINEERS MONTHLY
470 4th Avenue. New York 16, N.Y.

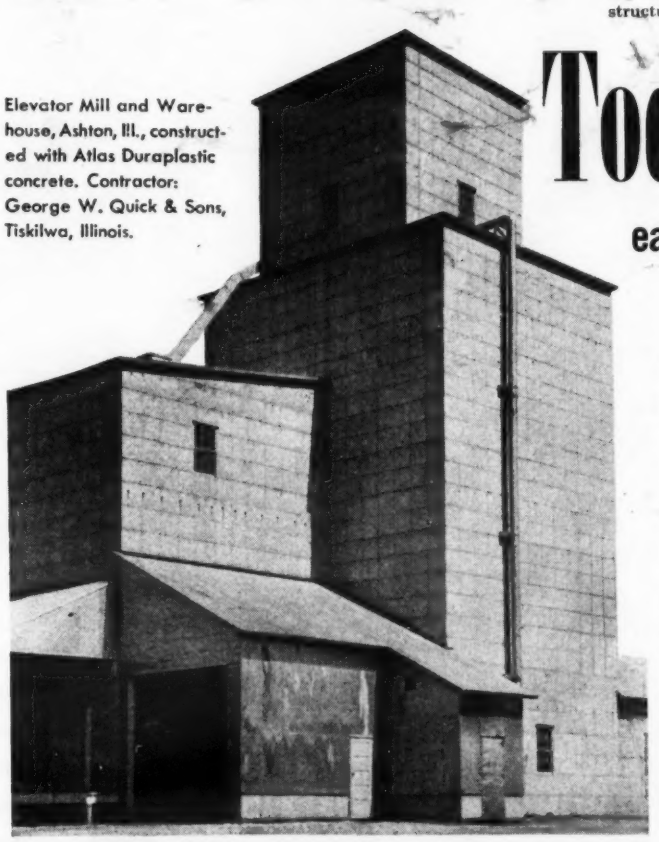


Ten Years Ago...

A Decade of ATLAS DURAPLASTIC AIR-ENTRAINING PORTLAND CEMENT

in August, 1939, this concrete test paving was laid in Second Avenue North, Minneapolis. The badly scaled section of roadway in the background was made with regular portland cement. The foreground section, *laid at the same time*, was made with Atlas Duraplastic—the first commercial use of the air-entraining portland cement originated and developed by Universal Atlas.

Both sections, subjected to the severity of ten Minneapolis winters and to heavy applications of de-icing salts, are shown just as they appeared in July, 1949—convincing proof of the characteristic durability of Duraplastic concrete, of its high resistance to freezing-thawing weather and the scaling action of de-icing salts. Longitudinal structural crack shows some ravelling. Note perfect transverse joint.



Elevator Mill and Warehouse, Ashton, Ill., constructed with Atlas Duraplastic concrete. Contractor: George W. Quick & Sons, Tiskilwa, Illinois.

Today... more plastic easy-to-place structural concrete with DURAPLASTIC*

During the past decade, the advantages of Atlas Duraplastic air-entraining cement for paving concrete have been increasingly applied to structural and mass concrete—for foundations, walls, columns and floors; for slip-form work, gunite, stucco and other uses.

Particularly, has the increased plasticity of Duraplastic concrete been of benefit in structural work. For example, on this elevator mill and warehouse, the contractor reported, "Use of Duraplastic saved about 12 man-hours of labor per day while running concrete walls. First job on which we have used Duraplastic, and were more than satisfied with the results. Will use it in the future."

As it does for paving concrete, Duraplastic for structural and mass concrete permits the use of less mixing water for a given slump. The resulting mix is more plastic, more workable, more uniform and more cohesive. It's easy to place and finish. Water-gain and segregation are reduced. Surface appearance is improved and exhibits higher resistance to the effects of weather-exposure.

Duraplastic provides the precise amount of air-entraining agent interground with the cement for satisfactory field performance. It complies with ASTM and Federal specifications, sells at the same price as regular cement and calls for no unusual changes in procedure.

Send for new free booklet, *"A Decade of Duraplastic Air-Entraining Cement." Write to Universal Atlas Cement Company (United States Steel Corporation Subsidiary), Chrysler Bldg., New York 17, N. Y.*

OFFICES: Albany, Birmingham, Boston, Chicago, Dayton, Kansas City, Minneapolis, New York, Philadelphia, Pittsburgh, St. Louis, Waco.

**"Duraplastic" is the registered trade mark of the air-entraining portland cement manufactured by Universal Atlas Cement Company.*

CE-D-100

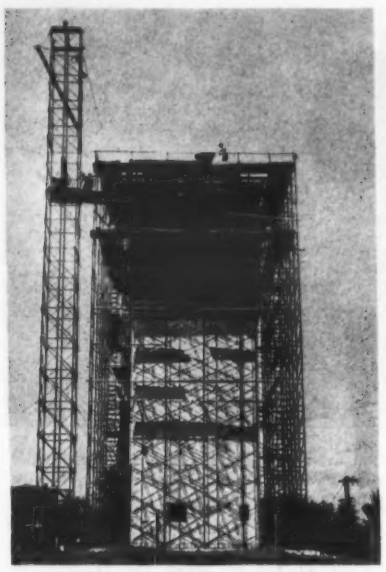
ATLAS DURAPLASTIC TRADE MARK REG. U. A. C. CO.

AIR-ENTRAINING PORTLAND CEMENT

MAKES BETTER CONCRETE AT NO EXTRA COST

A UNIVERSAL ATLAS PRODUCT

"THE THEATRE GUILD ON THE AIR"—*Sponsored by U. S. Steel Subsidiaries—Sunday Evenings—NBC Network*



A quick-action locking device features Adjustomatic scaffolding, shown here on a television-tower project.

Steel and Aluminum Adjustable Scaffolds

It requires no skill to assemble Adjustomatic scaffolding, says the manufacturer, Automatic Devices, Inc., St. Louis, Mo. The quick action of the locking device is designed to save 50 per cent of the time usually lost in erecting and dismantling scaffords.

Available in steel or aluminum construction, the Adjustomatic has only two basic parts: end frames and cross braces. It is erected by setting the cross frames over two vertical pins on the end frames and, with a "flip of the fingers", locking the brace in position. The coupling pins are welded to the frame. The standard 5-foot end frame has been tested to a load in excess of 30,000 pounds, according to the company.

Designed for a variety of construction and maintenance work, Adjustomatic scaffolds are available in a number of section sizes. The company points out that there are no bolts, wing nuts, or other loose coupling parts. The platforms may be placed on either of two levels on each of the end sections. Platform extenders, jack screws, casters, and other standard interchangeable accessories are available for use with this system.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 147.

An Interior Light Spots New Plumb Bob

Have you had trouble trying to set a plumb bob under adverse lighting conditions—perhaps during night or late afternoon work, in a tunnel, on an excavation job? Well, a new illuminated plumb bob has been devised to overcome this problem and eliminate "guess-by-sight" work.

Made by the Illuminated Plumb Bob Co., 2521 Third St., N. E., Washington 2, D. C., the new bob has a 3-volt pin-type bulb with a magnifying lens and two pin-type batteries set inside for accurate spotting. A twist of the screw on the bob top illuminates the surface to be plumbed with a pencil-point light projected through the tip of the bob. The battery and bulb can be easily removed and replaced by screw caps at the tip, if desired.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 125.

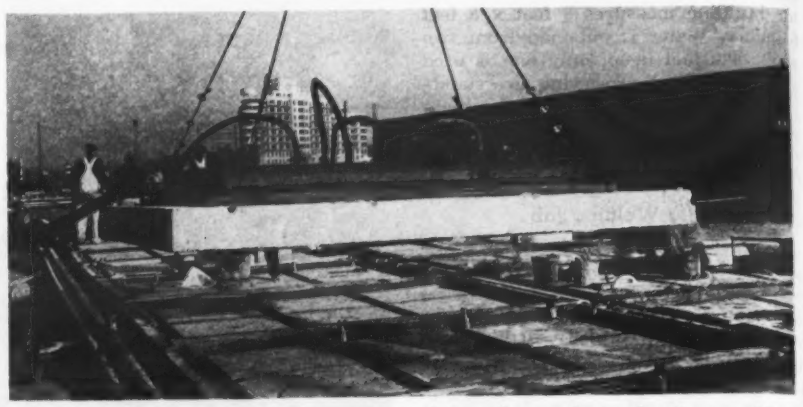
U. S. Rubber Appointment

The United States Rubber Co., New York City, has appointed Herbert G. Kieswetter Assistant General Manager of its Mechanical Goods Division, which manufactures conveyor and transmission belting, V-belts, hose, and other rubber and plastic goods. Until recently he was Vice President and Assistant General Manager of United States Rubber Export Co., Ltd.

Data on Front-End Loader

A circular describing the 8-cubic-foot Getman hydraulic front-end loader is available from Getman Bros., Manufacturing Div., South Haven, Mich. The features indicated in the bulletin include hydraulic lift for load control and discharge, full vision for operator, and caster-wheel steering. The loader will lift to a height of 7 feet 8 inches and turn within a 6-foot 6-inch radius. High-gear speed is 17 mph. The bulletin also indicates that the loader is powered by 13-hp air-cooled engine, with a 5-speed truck-type transmission. Photographs illustrate the operation of the loader.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 72.



The Vacuum Concrete Lifter removes slabs when only twelve hours old.

Vacuum Concrete Precasting Doubles Speed of Construction. Write for information and literature.

Vacuum Concrete, Inc. 4210 Sansom Street, Philadelphia 4, Penna.

GREENER PASTURES WITH "FLECO"

REG. U.S. PAT. OFF.

Note the "stumped" acreage in the background

Diesel D7, equipped with a Fleco Root Rake, owned and operated by J. E. Price, J. B. Ranch, Sunniland, Florida, is shown in illustration directly above, clearing new pasture lands in the Everglades. A Fleco Detachable Stumper was used to stump the acreage prior to mounting the Fleco Rake for piling operations.

ONE TRACTOR, ONE FLECO DETACHABLE STUMPER, ONE FLECO RAKE—MORE CATTLE

INCREASE THE PRODUCTIVITY OF YOUR LAND WITH FLECO PRODUCTS

DISCUSS YOUR LAND-CLEARING PROBLEMS WITH YOUR FLECO-"CATERPILLAR" DISTRIBUTOR

FLORIDA Land Clearing Equipment Co.

1561 West Church Street Jacksonville 3, Florida P. O. Box 2317

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Gravel Roads Made Black-Top by County

Grant County, Ind., Rebuilt 20 Miles of Gravel Roads Last Year Along With Other Work

✦ GRANT County is located in the northeast quarter of Indiana, about halfway between Indianapolis and Fort Wayne. Rectangular in shape, it measures 19 miles north and south x 22 miles east and west. According to the last official (1940) census, the county has a population of 55,813, of whom nearly half (26,767) live in Marion, the county seat. The county embraces thirteen townships.

Serving this area are 887 miles of county roads under the jurisdiction of the Grant County Department. Besides this road mileage, the department also maintains about 225 bridge structures. Of these, eight are good-size bridges with spans averaging 200 feet; span lengths of the others range from 5 to 60 feet. The longer bridges cross the Mississinewa River which cuts across the county from the northwest to the southeast corner.

The county road mileage is divided into six classifications as follows:

	Miles
Gravel or crushed stone	696.1
Low-type black-top	178.9
High-type black-top	5.8
Concrete	4.0
Brick	1.7
Dirt	0.5
Total	887.0

Gravel to Black-Top

The bulk of the county roads consist of either gravel or crushed-stone surfacing, there being plenty of gravel available in the eastern part of the county, and sources of good crushed stone in the western end. The low-type black-top roads, which rank second in total mileage, consist of either built-up bituminous mats or mixed-in-place pavements. For the latter group, crushed gravel and asphalt are mixed on the road by motor graders. The high-type black-top classification is chiefly Kentucky rock asphalt that is laid by a mechanical spreader.

Every year a portion of the gravel or stone roads are converted into low-type black-top pavements as part of the Grant County Highway Department's improvement program. Last season 20 miles of gravel road were rebuilt in this manner. The average width of a county highway is 18 feet.

First the surface was given a prime coat, chiefly to settle the dust, of SC-1 asphalt applied at the rate of 0.25 gallon to the square yard. Then a new mat was put on with three successive shots of MC-3 asphalt, also applied at the rate of 0.25 gallon to the square yard. Each application of bitumen was covered with aggregate, either washed crushed gravel or crushed stone, graded from ¾, ½, and ⅜ inch down respectively. For the average mile of this betterment work, 2,500 gallons of bitumen were required, together with 125 tons of each of the three sizes of aggregate used.

Aggregate by Contract

Besides the addition of new black-top mileage, the County also seal-coated 40 miles of other bituminous pavements. All materials are purchased by contract. Last year approximately 290,000 gallons of bitumen, either SC-1 or MC-3 asphalt, were supplied by the Standard Oil Co. of Indiana, and shipped in 10,000-gallon tank cars from Whiting, Ind., to Marion. Of the 29 cars that were shipped, 24 contained MC-3 and 5 held SC-1 asphalt.

Road work accounted for 97,000 tons of gravel and stone in the preceding year. Washed gravel is used in the black-top operations, as is crushed stone, but pit-run gravel suffices for the resurfacing of gravel roads. Six different materials companies supplied the County with aggregate after low-bid contracts had been awarded. This is done at the close of one construction season so that the quarry and pit men can process the material in time for work to get under way in the spring.

C. & E. M. Photo

The shop and garage of Grant County, Indiana, Highway Department are located near the south part of Marion in a 60 x 120-foot building with red tile brick walls.

The stone or gravel is bought f.o.b. at the plant, and hauled to where it is to be used by county trucks. The asphalt is usually shipped directly to Marion where it is transferred to the county bituminous distributor—an 820-gallon South Bend unit mounted on a Studebaker truck—which delivers it to the job. Sometimes a tank car is sent to a siding closer to the work, particularly if in a remote part of the county. Then a Cleaver-Brooks tank-car heater is set up to warm the contents of the car,

(*Concluded on next page*)

CONCRETE VIBRATORS

MESSENGER
Flexible Shaft
VIBRATORS
and
FLEXIBLE SHAFT EQUIPMENT
FRANK D. MESSENGER
P. O. Box 124
FAIR HAVEN, MICH.
Use "Messenger" Service
Some exclusive territories now open for dealerships.

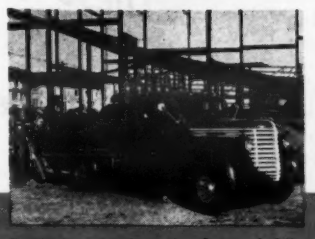
BIG JOBS, TOUGH JOBS, ON THE ROAD OR OFF—

GENERAL works faster, safer, cheaper,

Lasts Longer

● The General L. C. M., for most work off-the-road, has a massive, lugged tread that develops extra traction forward or backward. Exceptionally difficult to cut, chip or bruise even under difficult working conditions.

● The General H. C. T., for most work on-the-road, rolls easily, quietly; gives more safety, more quick-stopping power—rain or shine. Unusually thick, deep tread gives amazingly long mileage.



For lighter trucks—the General All-Grip's thick tread blocks give extra traction on or off-the-highway. Rolls quietly, smoothly; stops quicker... rain or shine. Ideal tire for pick-up trucks under heavy loads.

The General Tractor Grader Tire combines maximum drive-wheel traction with two-way, self-cleaning tread design for extra traction, forward or backward. The General Ribbed Grader tire steers easily; prevents side slip.

THE GENERAL TRUCK TIRE

SPECIFY GENERAL TIRES ON YOUR NEW EQUIPMENT

Gravel Roads Made Black-Top by County

(*Continued from preceding page*)

and to transfer it to the distributor.

In patching or resurfacing a gravel or stone road, the county trucks end-dumped the material on the highway where it was leveled off and shaped by Bucyrus maintainers pulled by Case rubber-tired tractors. As part of the regular maintenance of gravel roads, a maintainer passed over each mile, usually once a week, but never at a greater interval than once in two weeks.

Road Equipment

The County has six road maintainers to go around the 13 townships, and has one dump truck for each township. The trucks average 3 yards each, and are either K-7 Internationals or Diamond T's. They are kept in the township to which they are assigned, under the care of an assistant superintendent. Other trucks include one for bridge maintenance and a shop truck which is stationed in the county garage. For winter maintenance on its highway system, the County has 7 Root plows—3 V-type and 4 one-way plows—to hook on to the trucks. Cinders and sand are used for ice control, these abrasives being spread on from the trucks with hand shovels.

Other major road equipment includes an Insley ½-yard shovel; an Austin-Western loader; 3 motor graders—Allis-Chalmers, Austin-Western, and a Galion; an Austin-Western roller; a Caterpillar Sixty tractor; and a 1-bag concrete mixer. The mixer is seldom used now, as transit-mix concrete is available to all parts of the county.

This listing does not include, of course, the many hand tools used, in particular for bridge maintenance on both timber and concrete structures. The bridge crew was kept active all through the year, strengthening structures that had become undermined. A great deal of this work included replacing wing walls and building up broken-down abutments. In 1948 the County built, under contract, a three-span 205-foot steel and concrete bridge over the Mississinewa River at the southeastern edge of Marion.

County Shop

All maintenance of equipment is handled at the Grant County Highway Department shop and garage located near the south part of town. The 60 x 120-foot building on a 3-acre piece of land was built in 1936. It has a concrete floor, red tile brick walls, and steel trusses supporting a built-up roof. Ample windows and overhead lights illuminate the building, which has steam heat from a Pacific Steel boiler and a stoker furnace.

The front of the garage has two stories, with the office and stockroom on the ground floor and a sign-painting shop upstairs together with some storage space. The rest of the structure is all shop and garage. A 5-ton hydraulic hoist is in the floor, and equipment jacking is also handled with Weaver portable floor hoists. A 2-ton chain fall runs along the roof beams. The building is entered through three 12 x 12-foot overhead sliding doors.

In one corner of the garage is the battery and stockroom where batteries are charged on a G-E Tungar charger. Other equipment includes a Gardner-Denver air compressor; an Alemite greasing unit; two Black & Decker electric drills; bench vises; oxyacetylene torches; and small tools. Here also is stored a Weed-O-Matic automatic weed sprayer which is towed by a truck and used with 2,4-D weed killer.

Finances

In Indiana counties, funds for road work are derived from the state gasoline tax of 4 cents a gallon, and the revenue from auto license plates. From these sources the state first takes 65 per cent with the counties getting the rest, prorated according to the road mileage in the county and the license plates that are sold. In Grant County the highway funds average $170,000 a year. Incorporated towns get their own share of the gas tax, hence the counties do not maintain streets or roads through the towns. Grant County does maintain streets in one unincorporated town.

C. & E. M. Photo

Grant County Highway Superintendent Emmett Hoover (right) explains to Marion Davies, highway-garage clerk, how sewage will flow through the section of pipe he is inspecting.

Grant County Highway Department is headed by a 3-man commission with Everett McIlwaine, Chairman, Lora Tudor, and Herman Seeley. The Commissioners are elected to office, one from each of three districts in the county, for a 3-year term. These terms overlap so that there is always one holdover in office at each election.

Emmett R. Hoover has been Highway Superintendent for the past eight years. The 34 other employees of the Department include 13 assistant superintendents, one in each township; 11 maintainer and motor-grader operators and truck drivers; 5 laborers; 4 bridge maintenance men; and a clerk.

Two-Unit Aggregate Plants

A new 20-page booklet covering a complete line of portable combination two-unit crushing and screening plants has been issued by Pioneer Engg. Works, 1515 Central Ave., Minneapolis 13, Minn. It covers primary and secondary rock and gravel plants, featuring their portability and adaptability to varying conditions for aggregate production. Complete specifications are given, together with a guide for selecting equipment.

A full cutaway view of two typical plants shows the flow of material through the units and explains the exclusive Pioneer feature of split feed, said to increase greatly the screening capacity of the plants.

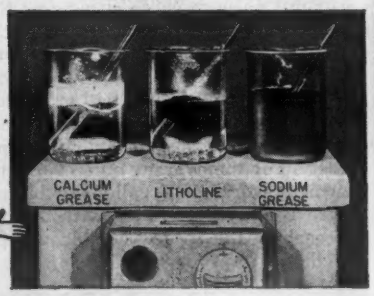
This literature may be obtained from the company by requesting Bulletin 574A, or by using the Request Card at page 16. Circle No. 34.

ONE Grease for ALL

"Yes—One Grease, One Gun and A Better Job too!"

Here is a versatile grease that can be used with absolute confidence *wherever* lubrication is needed—chassis, wheel bearings, water pumps, universal joints, etc., in winter or summer—under *all* kinds of operating conditions.

These 4 Severe tests prove SINCLAIR LITHOLINE is better than any single grease!



WATER RESISTANCE TEST!

Samples of each grease are heated in beakers of water. Near boiling, the sodium grease disintegrates into soapy water and oil. Shortly after boiling the calcium grease shows foamy emulsion as grease absorbs excess water. Litholine remains unaffected, proves its superiority in combating wet conditions.

SCENE: Sinclair's Research Laboratories, Harvey, Ill.

CAST: Two commonly-used greases of highest quality; a calcium soap chassis lubricant and a sodium soap wheel bearing grease; and Sinclair's Litholine.

SINCLAIR REFINING

Power Drag Scrapers In ⅓ to 4-Yard Sizes

A new line of power drag scrapers designed especially for excavating hard-packed materials, has been engineered by Sauerman Bros., Inc., 564 S. Clinton St., Chicago, Ill. With the Rapid-Shifting scraper, as it is called, the operator, stationed at the drag-scraper hoist, has complete and automatic control of the tail end of the machine. He can spot the scraper bucket instantly wherever he wishes. This saves time, says Sauerman, and assures better results when excavating non-caving materials or handling work which requires constant shifting of the line of travel of the bucket.

The feature of the system is the three-drum hoist and elevated tail-bridle assembly. The bridle frame for the tail block rides on a bridle cable stretched between two tail towers. The third drum of the hoist moves the bridle frame in one direction, the pull of the outhaul cable pulls it in the opposite direction, and the drum brake holds it positioned as desired.

The operator of the new Sauerman power drag scraper can spot the scraper bucket wherever he wants, due to the three-drum hoist and elevated tail-bridle assembly.

These new Sauerman units are manufactured in sizes from ⅓ to 4 cubic yards. They may be furnished with a gasoline, diesel, or electric-driven three-drum roller-bearing hoist. Standard operation spans run from 200 to 400 feet.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 93.

A ½-Ton Pick-Up

A new ½-ton truck with conventional two-wheel drive was recently announced by Willys-Overland Motors, Inc., Toledo 1, Ohio, during a showing of its restyled line of utility vehicles. Designed for rugged duty, the truck is powered by a new F-head engine named the Hurricane.

The truck is manufactured in the pick-up body style. Inside dimensions of the pick-up box are 48½ inches wide, 15 23/32 inches deep, and 78 11/16 inches long. The tail-gate, which opens downward, is said to provide a strong platform for loading and unloading the truck. The vehicle has a curb weight of 2,868 pounds and a gross vehicle weight of 4,000 pounds. It is 74¾ inches wide and 183¾ inches long overall. The wheelbase is 118 inches.

The 4-cylinder Hurricane has a 3⅛-inch bore with a 4⅜-inch stroke, giving a displacement of 134.2 cubic inches. Providing 72 hp at 4,000 rpm, with a compression ratio of 7.4 to 1 or 7.8 to 1 for high altitudes, the Hurricane features an extra-large intake valve in the cylinder head, an exhaust valve in the cylinder block, full-pressure lubrication to the main connecting rod and camshaft bearings and rocker arms, a pressure jet to the timing gears, a crankshaft fully counterweighted and dynamically balanced, and a floating oil-pump inlet.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 6.

Wall-Form Construction

A series of new bulletins illustrating and explaining how to set up Symons wall forms is now available from Symon Clamp & Mfg. Co., 4251 W. Diversey Ave., Chicago 39, Ill. A blueprint of model foundation gives complete dimensions and a chart indicating the number of panels, fillers, inside corners, outside corners, inside bay corners, outside bay corners, pilaster boards, wale sets and ties necessary for the job. Detailed step-by-step instructions are given, and two methods for the construction of pilasters are also explained and illustrated.

Another bulletin in the series recommends a method of using wales with Symons forms to assure a durable and clean job. It illustrates a complete corner section showing proper use of wales; also a section through the wall showing the use of bottom wales on both sides for ready-mix, vibration, or other heavy pressure. A standard form layout on which can be incorporated all necessary information regarding a contemplated foundation is also offered. With this information, the contractor will receive a complete breakdown of forms and hardware required to build the forms.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 77.

Thirty Years in Construction

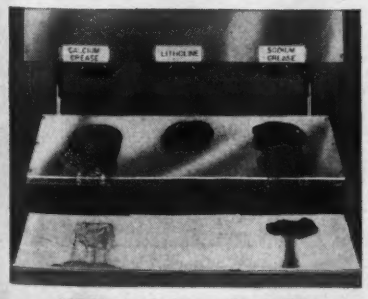
This year marks the thirtieth anniversary of the founding of Johnson, Drake & Piper, Inc., of Minneapolis. The firm began its history in 1920 as a small building contractor, and entered the field of heavy construction during the early days of the Babcock highway program in Minnesota. Its operations are now conducted on an international scale.

Three executives have been with the firm since its founding: George M. Drake, President; Robert P. Bayard, First Vice President; and George Heller, Administrative Vice President and Secretary-Treasurer.

Lubrication Jobs!

LOOK WHAT ONE-GREASE—ONE-GUN LUBRICATION MEANS TO YOU...

1. Superior protective lubrication
2. No danger of misapplication
3. Less chance for contamination
4. Reduced time-out for lubrication and maintenance
5. Fewer servicing man-hours
6. Less wastage
7. Fewer dispensing units
8. Smaller grease inventories
9. Simplified purchasing and distribution
10. A finer grease at every lubrication point

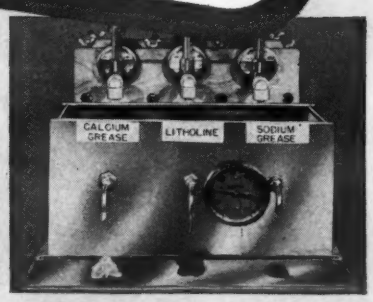


HEAT-RESISTANCE TEST!

The samples are heated on a plate. At 190°F., the calcium grease disintegrates. At 340-350°F., the sodium soap structure collapses and releases the oil. Bearing failures would follow. At 380°F., Litholine shows no effects, proves superior for high temperature lubrication jobs.

MECHANICAL STABILITY TEST!

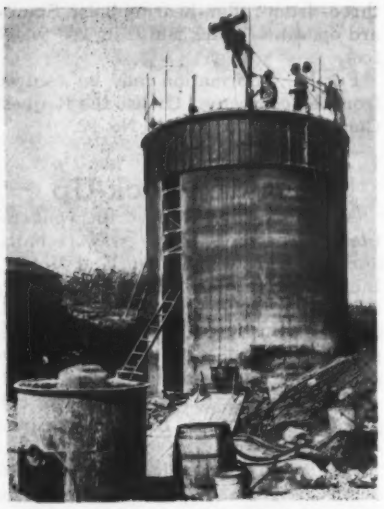
Worked (kneaded) samples are placed beside samples of unworked grease. Steel balls are dropped. Distance ball sinks in worked samples shows increase in softness—loss of stability. The calcium grease showed greatest increase in penetration, the sodium grease next. Litholine showed no difference whatever . . . proving its superior mechanical stability in service.



LOW TEMPERATURE PUMPABILITY TEST! Lever-type grease guns are filled with chassis greases and cooled. At 20°F., it is impossible to pump the sodium grease. At 0°F., it is impossible to pump the calcium grease. But Litholine still pumps in good volume! Yet Litholine is a heavier (harder) grease. Thus, Litholine has the body for summer service yet is pumpable in severely low temperatures.

COMPANY

For lubrication counsel, or more information on Litholine, see your nearest Supplier of Sinclair Products, or write to Sinclair Refining Company, 630 Fifth Avenue, New York 20, New York.



Slip forms rise an inch every 5 minutes as this concrete silo is built in North Chatham, N. Y., using the Swedish Concretor method and equipment. The seamless one-piece silo was finished after 40 hours' operation.

Swedish Slip-Form Method Comes to U.S.

Swedish machinery and methods for erecting concrete silos and storage bins have recently been introduced in this country by B. M. Heede, Inc., 80 Broad St., New York 4, N. Y. Developed by Emrik Lindman, outstanding Swedish construction engineer, the Concretor method employs steel slip forms and hydraulic jacks; the sliding steel form rises at the rate of a foot per hour with a crew of two men per shift, according to Heede.

The entire unit is easily assembled and demounted, and is moved from one job to another on a 2½-ton truck. The form can be used under all weather conditions, according to the manufacturer, and comes in standard sizes of 13¼, 13½, 16 5/12, 16½, 19⅔, 26 5/12, and 26½ feet, inside diameter. Experienced foremen of the Heede firm are available to train contractor crews in the operations.

General procedure is as follows. A concrete working platform supported by an inner steel ring is first set up. A concrete tray for form delivery swings on a center pin. Three electro-hydraulic jacks climb in unison or independently up three plain, round jack rods secured at three of the twelve form yokes. Vertical rods rise from each of the yokes and are hooked to secure a safety rope railing. Reinforcing rods, vertical and horizontal, are placed as the building operations proceed. A single gasoline-engine generator supplies current for the mixer, the bucket hoist, the hydraulic jack pump, and lights for night operations. The jacks rise at the rate of an inch every 5 minutes to give a continuous non-jointing pour. The outer ring section can be spread with wedge pieces to increase the wall thickness from 5 to 8 inches. After the structure has risen to the desired height, the jacks and hoist are dismantled. The outer ring is lowered by three lines to a special hand-operated winch, and the process is repeated for the inner-ring platform.

Further information on this new method may be secured from the company. Or use the Request Card at page 16. Circle No. 26.

Pumps in Construction

A folder of literature describing pumps to meet a wide variety of construction needs has recently been offered by Ralph B. Carter Co., of Hackensack, N. J. The full line of Humdinger contractors' pumps presented in the folder includes self-priming centrifugal pumps in 1½ to 8-inch sizes, capacities from 4,500 to 125,000 gallons per hour; single and double diaphram pumps; vertical self-priming caisson pumps; high-pressure jetting pumps; plunger pressure pumps; and self-priming electric-drive pumps.

The catalog consists of a series of thumb-indexed circulars, which list full specifications, pumping heads and capacities, and applications. Each is illustrated. Engineering data on the friction of water in pipes, conversion factors, and weight and volume equivalents are also supplied.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 7.

An Air Compressor With Jeep Mobility

A 60-cubic-foot Ingersoll-Rand air compressor rear-mounted on a Willys-Overland Jeep has been developed by the Monroe Auto Equipment Co., 1400 E. First St., Monroe, Mich., for cross-country mobility. The compressor is mounted in a welded all-steel frame which can be hydraulically raised for travel and lowered for site operation.

An Ingersoll-Rand compressor rear-mounted on a Willys-Overland Jeep supplies air to a pavement breaker. Monroe Auto Equipment Co. designed the combustion unit.

The compressor is driven by the Jeep engine through the rear power take-off. The compressor unit can be detached from the Jeep, releasing the vehicle for use with other equipment.

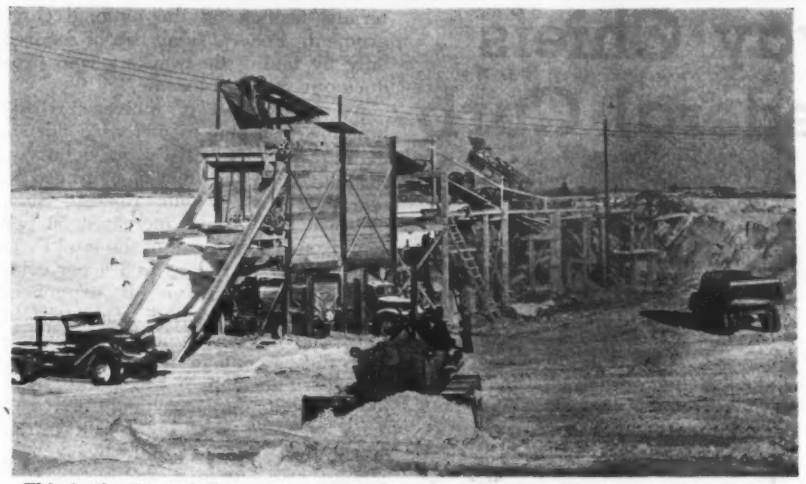
Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 12.

Rock Crushing Plant; Tools and Technique

The Sargent Bros., Inc., crushing plant 5 miles east of Winterset, Iowa, can crush 75 tons of road rock and ag lime per hour. Its yearly output amounts to 100,000 tons. The plant includes a Pioneer 20 x 36 jaw crusher driven by a Caterpillar diesel D13000 engine which also furnishes power for a feeder, conveyors, and screens. Another D13000 drives a Gruendler Model D hammermill, and a D17000 with a converted RD8 engine drives a Cedarapids 42-inch hammermill. Diesel track-type tractors bulldoze the blasted rock into position for loading by a ¾-yard Harnischfeger shovel. A Gardner-Denver air compressor powered by a D8800 engine is used for rock drilling.

The company uses Caterpillar diesel track-type tractors to build and maintain haul roads to the plant. For stripping, three D7's are used at various times with Caterpillar 7S bulldozers, a LeTourneau scoop, and a La Plant-Choate bulldozer, scoop, or pan. A D4 with a T4 Traxcavator loads and stockpiles rock and lime.

Dodge trucks haul the rock about 900 feet to the crushing plant. The overburden averages about 18 feet, and the workings cover approximately 20 acres.



This is the Sargent Bros., Inc., crushing plant 5 miles east of Winterset, Iowa. A D7 tractor with a 7S bulldozer dozes rock and snow.

Tried Analysis Yet? For Wheels and Tires

Believed to be the first such arrangement ever devised in the industry, a new Tire and Wheel Analysis Plan has been announced by the B. F. Goodrich Co., Akron, Ohio. According to the plan, any company desiring the service can have its wheeled vehicles studied and recommendations made without cost. Goodrich believes that tire and wheel costs can be cut as much as 50 per cent through the application of the right type, and size of tire, and the right tread compounds.

Upon request, an experienced tire and wheel engineer will survey your materials-handling program, studying loads, hauls, equipment, and discuss any special tire and wheel problems. On completion of the study, he will submit recommendations on the best type of tire and wheel for each particular service. Information on the longest-wearing rubber compounds for particular kinds of service, and on retreading of tires, will be included, as well as suggestions on tire care and maintenance. There is no obligation on the part of the company which has sought the analysis.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 8.

Paver Admix Meter

A new admix meter for installation on Koehring 16-E or 34-E Twinbatch pavers has been developed by the Koehring Co., 3026 W. Concordia Ave., Milwaukee 16, Wis. The attachment is also suitable for use with water batchers in ready-mix or central-mix plants.

The meter is designed to direct a predetermined quantity of liquid air-entraining agent into the paver mixing drum with the water. Entirely mechanical, it is actuated by movement of the paver skip. Its capacity is adjustable from 1½ to 20 fluid ounces, in 0.1-ounce increments. A 40-gallon supply tank is included in the arrangement along with all necessary operating linkages. The meter can be furnished with all new Twinbatch pavers or it can be installed in the field.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 123.

Steering-Gear Design

A folder describing the Ross cam and twin-lever steering gear, designed to combine high-speed stability and parking ease, is offered by the Ross Gear & Tool Co., Lafayette, Ind. Improved characteristics of the mechanism have been obtained by using the Ross variable-ratio feature and by the increased mechanical advantages resulting from the use of a shorter steering arm. With this unit the driver has at his disposal a dual-ratio gear which automatically changes from one ratio to another to suit the requirements of steering stability and easy wheel turn. Operating principles and construction are illustrated in a full-page drawing in the folder. Points of engineering interests are listed on the back page: the variable ratio, the wide angular arm travel, capacities, the unit's precision, and the simplicity of construction and adjustment.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 90.

Joins McKiernan-Terry Corp.

John W. Wilkinson has joined McKiernan-Terry Corp., New Jersey manufacturer of heavy material-handling equipment, special machinery, and pile hammers, as General Sales Manager. For the past ten years he has been associated with the Pomona Pump Division of Fairbanks, Morse & Co. as a field project engineer in the eastern area.

State Highway Chiefs Ask for Federal Curb

North Atlantic States Officials Would Cut Highway Costs by Halting Federal Expansion in State Road Affairs

✦ AT a three-day meeting concerned primarily with road-financing problems, the Association of Highway Officials of the North Atlantic States sprang a surprise. It went on record with the opinion that "the member states' highway problems can best be solved at the state levels, with a minimum of regulation from the Federal government". The "home rule" resolution, adopted by the road chiefs of eleven northeastern states and the District of Columbia, emphasized that state highway departments rather than Federal authorities are best fitted to serve the interests of the highway user. It was also pointed out that increased Federal expansion and participation in the administration of state highway problems is reflected by increases in road-building costs.

Approved by over 500 delegates, the resolution indicated that with increased highway production, the Federal government's per cent of overhead cost for the administration of the highway program should decrease rather than increase as is now the case. In presenting the measure, Spencer Miller, Jr., New Jersey Highway Commissioner and newly elected Vice President of the Association, stated that the resolutions committee considered it "evidence of a sense of sturdy self-reliance of our states, which is so essential both to sound Federal-state relations and the preservation of a working Federalism". The resolution was the outcome of a thought-provoking paper prepared by E. L. Schmidt, Chief Engineer of the Pennsylvania Department of Highways, and presented by him to the 26th Annual Convention of the highway officials, who met in New York City, February 21-23.

Schmidt Speaks

At the outset, E. L. Schmidt made it clear that the Pennsylvania Department of Highways was not advocating that Federal Aid to the states be discontinued, but "that there be no material increases in Federal-Aid appropriations, no further distinctions in Federal-Aid systems, no further increases in the proportionate share of Federal-Aid participation in highway construction, and no further expansion of Federal activities in the management of state highway affairs". The Pennsylvania Chief Engineer pointed out that his state is not in accord with the action taken recently by the American Association of State Highway Officials, a national group, in endorsing proposed Federal Aid to the extent of 75 per cent Federal funds on the Interstate System, coupled with 25 per cent state funds.

"Immediately upon the inception of a 75 per cent Federal and 25 per cent state division of construction cost," Schmidt warned, "the state would become a junior partner with the principal control being exercised by the Federal government. This policy would be in complete conflict with the original intent of the Federal-Aid highway concept." For many years there has been a 50-50 partnership between the Bureau of Public Roads and the individual states. Schmidt cautioned the states against "forfeiting their birthright in the direction of obeisance to an all-powerful central form of government which has as its ultimate object complete control of all governmental activities".

The Pennsylvanian deemed as fallacious the reasoning that states cannot afford to finance their own programs and must have Federal assistance. He called attention to the fact that the Federal government in collecting almost $1,200,000,000 from the motorists in a year, and returning only $433,000,000 to the states, is guilty of the greatest diversion of motor and gasoline taxes. "It is time", he went on, "for the representatives of the respective states to demonstrate the courage to fight the battle for sufficient funds at the state level through their elected representatives, and to quit fooling their people and themselves that Federal funds are secured in some mysterious fashion by the national Government. Federal funds can be secured only by taxing the workers who produce our national income."

As an example of increased road-building costs due to increased participation by Federal representatives, Schmidt cited the item of overhead in the Bureau of Public Roads. Such overhead costs have increased 50 per cent, from 2½ per cent of the total Federal-Aid appropriation to 3¾ per cent. "This action was taken", he explained, "at a time of increased production in construction which would normally reduce the percentage of overhead costs. In modern business, in the operations of the Pennsylvania Department of Highways, and in most other states, the percentage of overhead always decreases with increased production."

In summing up, Schmidt affirmed that "the highway problem can best be solved at the local and state levels, with minimum assistance and regulation from the Federal government. The withdrawal of the Federal government from the field of gasoline taxation and motor excise taxes, with these funds accruing to the states, would do more to improve the highway situation than any increases in Federal-Aid appropriations, or increases in the Federal share for highway construction with resultant increases of Federal control. If we persist in further demands on the Federal government, the states may just as well quit the field and let the Federal government do the entire job. The latter course would be fatal, but it is definitely the direction in which we are traveling."

The Opposition

Following Schmidt's address, Charles M. Upham, Engineer-Director of the American Road Builders' Association, spoke from an opposing viewpoint and called for an annual $4,000,000,000 highway program for the next 15 years, backed by Federal Aid. Upham was of the opinion that that amount was needed for the maintenance, repair, and

(*Concluded on next page*)

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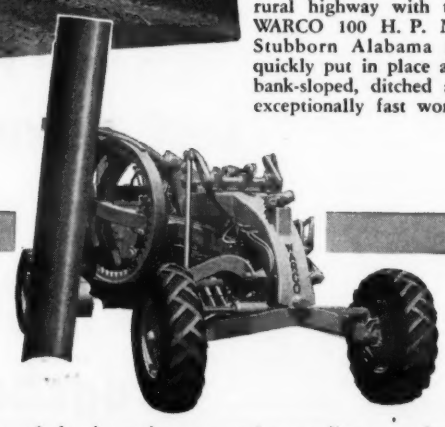

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new construction of highways throughout the country. He also mentioned that more toll roads may be expected if public highway construction does not increase, and said he felt that the nation's economy will benefit from increased Federal Aid to highways. Upham called Federal Aid "the spearhead of a highway program", maintaining that the "larger Federal Aid, the larger highway program you will have".

Progress in Federal-Aid highway construction was discussed in a paper of Thomas H. MacDonald, Commissioner of Public Roads, which was read by his assistant, Lawrence S. Tuttle. According to the Commissioner, the dollar investment in Federal-Aid construction completed in 1949 was the highest in its 34-year history. The construction put in place on active or completed projects cost $837,500,000, of which $425,500,000 was paid with Federal funds. Projects completed and opened to traffic during the year included 19,851 miles of primary, secondary, and urban highways; 3,140 bridges; and 645 railway-highway grade crossings eliminated or protected, or separation structures reconstructed.

The North-Atlantic states have been apportioned about 21 per cent of the postwar Federal-Aid funds, according to MacDonald, and progress in those states has been close to the national average. While 56,700 miles of highway have been completed in the entire country, the figure for the North-Atlantic states is only 1,900 miles. This is due to the greater density of traffic and the higher types of improvement required in this area, thus producing less mileage than might be expected from the national-average expenditure. Yet of the 44,000,000 motor vehicles in the United States, the Commissioner pointed out, 11,000,000 or one-fourth the total are concentrated in this North Atlantic area.

Investment Concept in Highways

The increase in motor-vehicle registration was also mentioned by Karl M. Richards, Secretary, Highway Policy Committee, Automobile Manufacturers Association, who stated that the 44,000,000 vehicles in this country were driven more than 419,000,000,000 miles last year—eight times the travel in 1921, twice that of 1930, and one-fourth more than the prewar peak of 1941. The automotive industry recognizes the existence of two major potential barriers to the further development of safe and efficient highway transportation in the public interest. These, said Richards, are (1) inadequate facilities for the operation of motor vehicles, and (2) excessive cost of motor-vehicle ownership and operation.

He urged an investment-concept approach to solving the highway problem rather than the more-taxes approach. The latter may ignore or place insufficient stress on the need for reduction of administrative waste and other highway expenditures unwarranted by benefits. The investment concept in highway planning and development, according to Richards, is the application of sound business investment policies to investment in streets and highways. Such an approach would eliminate the dispersion of highway funds.

Finance the Theme

In accordance with the general finance theme of the convention, one entire session was devoted to a panel discussion of financing highway programs to meet the public's demand. Toll roads and their financing were discussed by Gerard B. Gilbert of the Pennsylvania Turnpike; Paul L. Troast of the New Jersey Turnpike; and W. B. Getchell, Jr., of the Maine Turnpike. Francis L. Brown of the New York Department of Public Works touched on the New York Thruway and the proposed special license plate which its users would have to buy, and admitted that it too might be called a toll road.

Retiring President John C. Burnham, Assistant to the Chief Engineer of the Maine State Highway Commission, summed up the activities of the Association during his term of office, and then yielded the gavel to the new President—Ray F. Smock, Secretary of the Pennsylvania Department of Highways. Other newly elected officers include Spencer Miller, Jr., New Jersey State Highway Commissioner, as Vice President. Two incumbents, A. Lee Grover, Secretary and Treasurer, and his assistant Kenneth D. Rice, both from New Jersey, were reelected to office. The 1951 annual meeting will be held in Atlantic City, N. J.

The eleven states of the North Atlantic Highway Officials Association include Maine, New Hampshire, Vermont, Massachusetts, Connecticut, Rhode Island, New York, New Jersey, Pennsylvania, Delaware, Maryland, and the District of Columbia.

Onan Sales Representative

Frank Gernand of Portland, Oreg., is now a Direct Factory Sales Representative for D. W. Onan & Sons, Inc., of Minneapolis. His territory, with headquarters in Portland, includes the entire west coast and Alaska. Mr. Gernand will spend most of his time working in the field with dealers and distributors of Onan electric generating plants.

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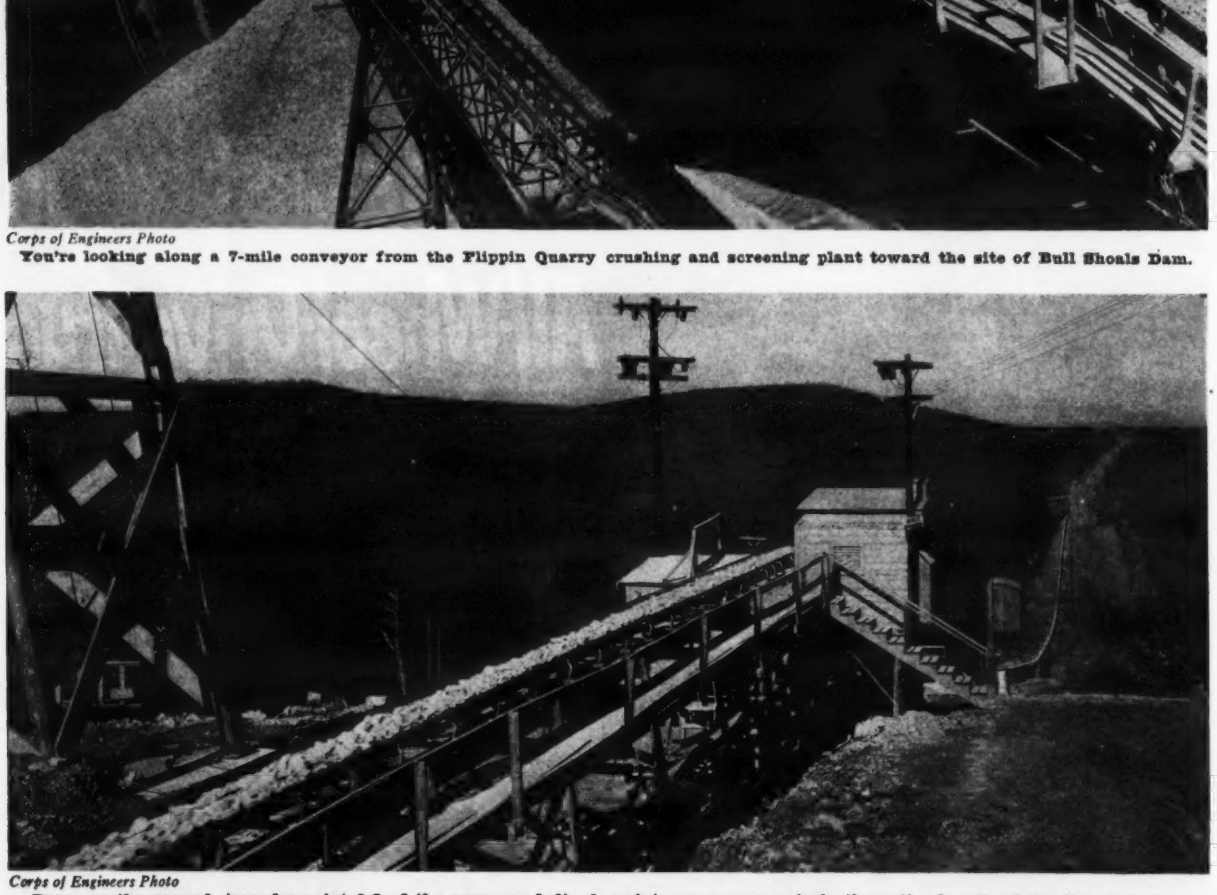
Aggregate Is Produced and Cooled

Corps of Engineers Photo

You're looking along a 7-mile conveyor from the Flippin Quarry crushing and screening plant toward the site of Bull Shoals Dam.



Corps of Engineers Photo

Down on the ground, transfer point 2-3 of the conveyor belt. A maintenance crew patrols the entire length of the line each day.

Corps of Engineers Photo

At the other end of the line, high up over the right abutment of Bull Shoals Dam, the aggregate processing plant in full operation.

Changes Made in Sand Plant Improve Gradation and Jump Efficiency of Cooling System

Photo on page 1

✦ EXTENSIVE changes in special aggregate equipment have been completed at Bull Shoals Dam, near Mountain Home, Ark. The revisions were necessary to eliminate "bugs" and improve the efficiency of what many engineers believe is the most advanced concrete-dam construction plant in the country today.

Ozark Dam Constructors, builder of the big flood-control and hydroelectric barrier across White River, took advantage of the time interval when second-stage river diversion was in progress last summer. During the 60-day period while normal activity was slow, changes were made in the concrete plant, the aggregate production plant, and the primary screening plant at the quarry 7 miles from the dam. Flippin Materials Co. holds the $9,447,100 Corps of Engineers contract for production of aggregates, while Ozark Dam Constructors holds the $22,146,440 contract for the dam. Both firms are composed of the same joint-venture contractors.

Sizing and Cooling Trouble

Corps of Engineer specifications, prepared by the Little Rock Office, call for elaborate control of concrete both during its production and after its placement in the dam. One of the broad general provisions is that all the aggregates, including sand, must be made from the same deposit of native material. The other feature is that the concrete temperature must be controlled below 65 degrees at the time it is mixed and placed, and followed by refrigerated structure cooling.

Both of these provisions are more easily written than performed. What is a concrete technician's dream is the contractor's nightmare.

Specifications for temperature control have been followed, but peak production of concrete had not yet been reached by June last year. Approximately 550,000 cubic yards of the total 2,100,000-cubic-yard content had then been placed, but it went in at an average rate of less than 100,000 cubic yards a month. Now the massive blocks of concrete are up above the maze of outlets, adits, penstocks and other openings. Concrete is rolling at the rate of 180,000 cubic yards a month, thanks to excellent control of the sizing and cooling of concrete which has been achieved for such a high rate of production. It wasn't hard while the weather was right, but it was a different story when peak production coincided with 100-degree summer temperatures.

Some changes were necessary at the quarry plant. Two new vibrating screens were installed as orignal screens showed signs of heavy wear.

The 7-mile belt-conveyor line needed no revision, because men had already been working for four months to cure trouble here. The entire electrical control system was junked and heavy-duty Allis-Chalmers controls went in. Four motors were replaced by machines of greater horsepower. Nobody can outwit lightning storms, so electricians still fight by day to replace small low-voltage condensers which the lightning occasionally burns out at night. Timber supports, the idlers, and the 30-inch conveyor belt gave good service and required no changes. Burned-out rotors in the original motors were replaced.

The main trouble at the sand production unit of the aggregate plant at the dam has been a fluctuation of sizes. One

(*Continued on page 26*)

At Bull Shoals Dam, Arkansas

Ice-Water Immersion Lowers Temperature of Aggregates; First Method Failed

By RAYMOND P. DAY,
Western Editor

+ CONCRETE placing temperatures under 65 degrees are maintained during hot summer weather at Bull Shoals Dam by means of a unique cooling process. Ozark Dam Constructors is trying for the first time on a large scale the immersion method of cooling. All concrete aggregates with the exception of sand are chilled by the unusual method.

Immersion equipment consists of duplicate sets of tanks for four sizes of aggregate, a gigantic refrigeration plant with a capacity of 1,689 tons at 40-pound suction pressure and the necessary pumps and piping. The concrete materials are dunked in 34-degree F water for approximately 30 minutes, and then sent on to the batching plant at low temperature. Despite considerably higher temperatures in the sand and cement, the concrete is being successfully controlled well below the 65-degree limit permissible under Corps of Engineer specifications.

Costing nearly $400,000, the big refrigerating plant would furnish enough ice each day it works to supply a city the size of Wichita, Kans.

Size of Dam Is Big Factor

The various temperature control measures were put into the specifications, according to the Corps of Engineers, as a means of reducing cracks. The measures were considered necessary because of the size of the dam and the variation in temperatures under which it may be expected to operate.

Bull Shoals Dam is a gravity-type multiple-purpose concrete structure which will contain 2,100,000 cubic yards of concrete when completed. It will have a maximum height of 283 feet, a base width of 230 feet, and a crest length of 2,256 feet. There will be a 26-foot roadway across the top of the dam.

Individual monoliths vary from 36 to 54 feet, with a 48-foot width predominating. There are 8 monoliths containing steel-lined penstocks 18 feet in diameter. These blocks will be 54 feet wide. The monoliths are being poured their entire 230-foot length in one operation, and not broken up by joints parallel to the axis of the dam.

Past experience indicated to the Army's design engineers that a continuous and systematic concrete-placing schedule was necessary to reduce cracking to a minimum. Moreover, the rate of concrete placement in a lift should be great enough to prevent the loss of chill. Major cracks usually occur in structures similar to Bull Shoals Dam where partially completed monoliths or transverse faces greater than 20 or 25 feet are left open or exposed for long periods of time. The longer the lifts are left open, the greater the possibility of major cracks occurring. This applies especially to concrete placed during the summertime, and then subsequently subjected to wintertime abrupt temperature changes.

Preliminary Temperature Studies

Bull Shoals specifications call for maximum 65-degree F placing temperatures, with the provision that refrigerating equipment must be used in all seasons until the concrete temperature decreases naturally to not more than 50 degrees. Concrete with a cement content as low as 2½ bags per cubic yard was originally planned, and much 3-bag concrete has already been placed.

The original specifications were written with the thought in mind that ice and refrigerated mixing water might be used in the mix, as was done at Fort Gibson, Friant, and Davis Dams. When Ozark Dam Constructors made studies regarding ice, however, it found that it would not be possible to place concrete when the aggregate in stockpiles was above 77.4 degrees. The maximum average weekly temperature at near-by Norfolk Dam had been 79 degrees in aggregates and 82 in sand, with occasional readings at peak of 85 degrees. Considering the dry process at Bull Shoals, plus the 7-mile conveyor ride perhaps in hot sun, the immersion method seemed best.

Past experiments and theoretical calculations on the cooling time for various sizes of aggregates showed the inundation method to be feasible. The relative low cost of cooling water, as compared to making ice, seemed to indicate that this method might even be preferable. Certain benefits over ice seemed certain. It would be unnecessary to control the mixing period to insure thorough melting of the ice. Also, an immersed piece of aggregate has the "cold" locked in its heart, somewhat like an over-conscientious inspector, and the concrete continues to grow colder for some time instead of warming up immediately.

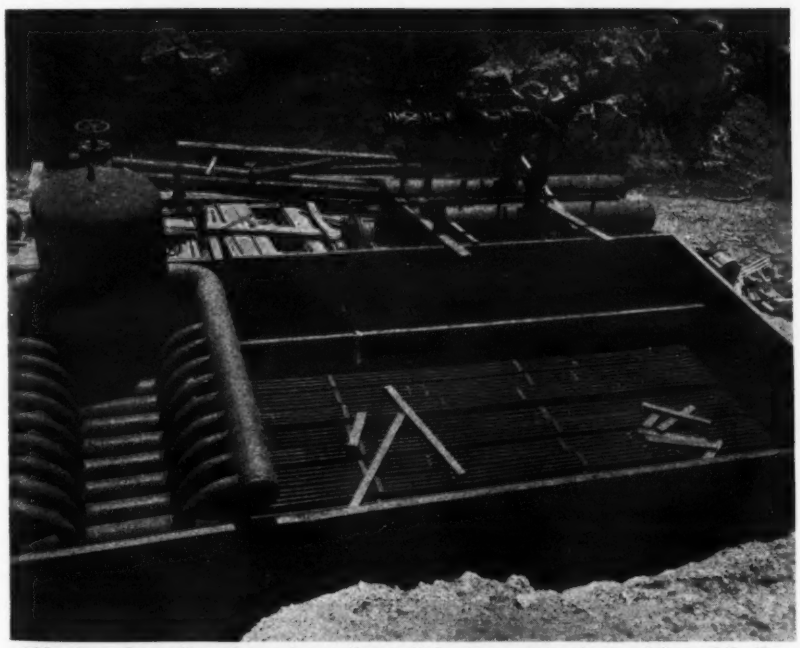
It has worked out exactly that way in practice. When the inundation method was first proposed, the question of free moisture in the aggregates arose. Very little if any difficulty has been experienced with free moisture.

Cooling Mechanics

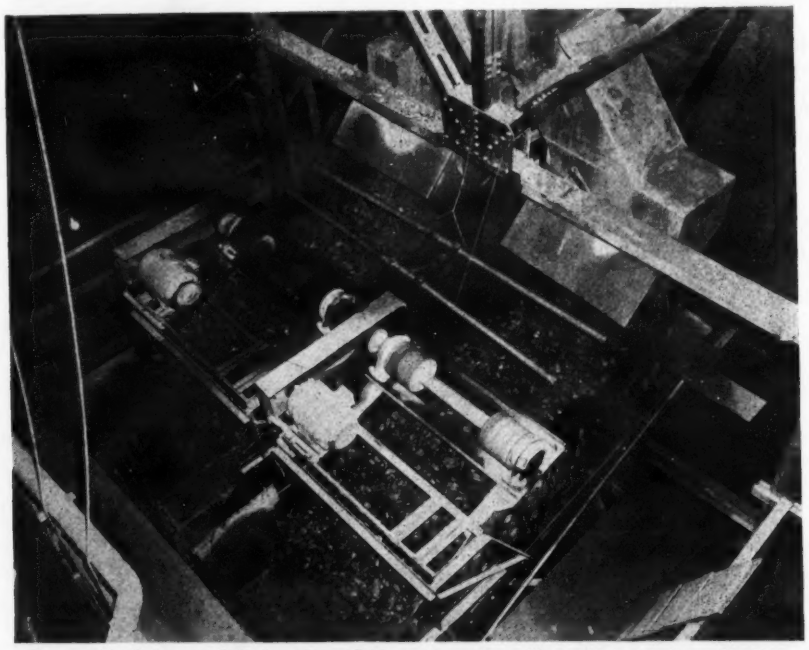
Immersion equipment consists of 4 twin sets of cylindrical steel silos, each 14 x 20 feet, and having a capacity of 138 tons of material. Materials are conveyed from the coarse-aggregate stock-

(*Continued on page* 29)

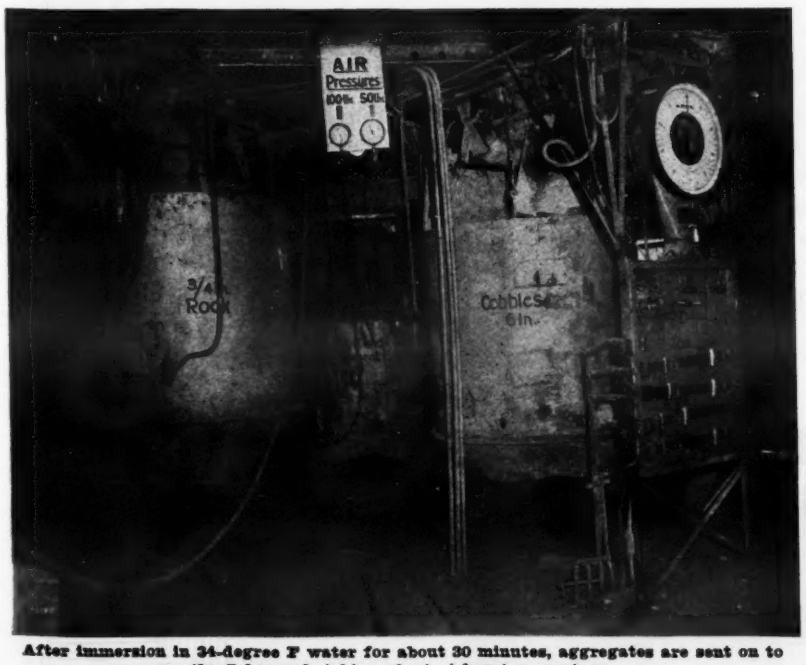
Corps of Engineers Photos



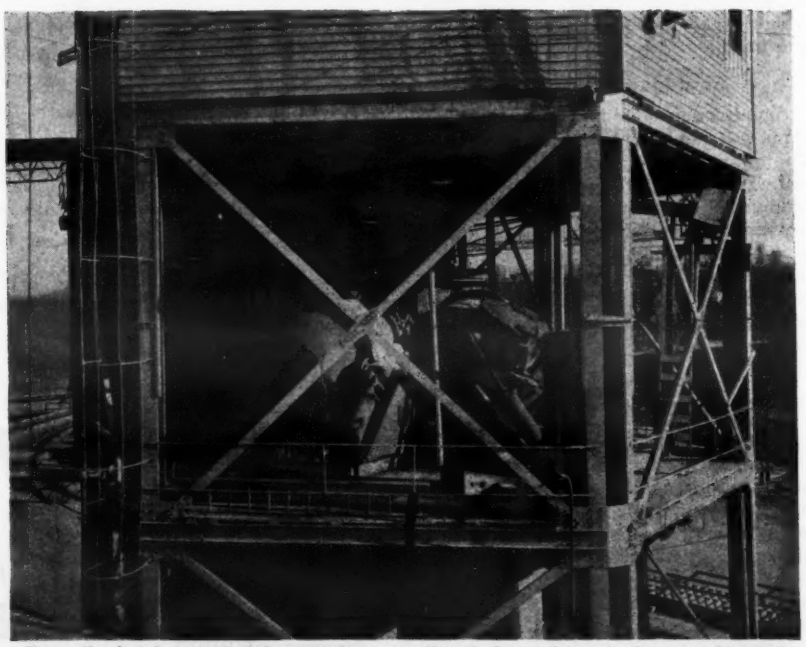
This view of a section of a water cooling unit for dam aggregate was taken while the refrigerating plant was being erected.



Six months later, an interior view of the aggregate cooling plant showing vibrating dewatering screens. Note the spraybars.



After immersion in 34-degree F water for about 30 minutes, aggregates are sent on to the Johnson batching plant at low temperature.



From the batcher, material, properly proportioned, drops down to four 4-cubic-yard Koehring mixers mounted on a secondary platform of the plant.

Aggregate Production For Bull Shoals Dam

(*Continued from page 24*)

of the causes of this, believed a man who may be suspected of knowing, was the fact that free fines were for some time routed through hammermills and impactors along with larger rock. The major changes in the sand plant were aimed at correcting that situation.

First of all, these free fines were separated and two new 750-ton concrete-stave storage silos 16 feet in diameter x 40 feet high were built.

Second, a new 18-inch by-pass conveyor, designed to run 325 fpm, was installed to carry free fines across to the return line from the hammermills. The belt becomes operative when these fines accumulate in sufficient quantity.

Partitioning of the original raw-material bins ahead of the impactors and hammermills was another of the changes made. Their tops were raised and widened. Four new vibrating screens 4 x 10 feet were installed to boost sand screening capacity and efficiency. This makes it possible to hold the permissible gradations within very narrow limits. The original sand tunnel had to be extended 20 feet, and both sand belts were raised to their maximum operating slope. One of the original lines, Conveyor No. 16, was relocated to form the waste belt mentioned previously.

These changes were designed to raise production levels and whip the fluctuations in screen sizes.

The original temperature-lowering device for sand consisted of two heat exchanger units. Each had 327 flues, 3 inches in inside diameter x 10 feet long. Water at 35 degrees circulated around these tubes. In theory the sand was supposed to flow very slowly through the flues, imparting a great deal of its heat to the cold water. In practice it did something else. Before it would flow that slow it wouldn't flow at all. The original cooling device was filed and cataloged by many of the construction stiffs who worried with it as "another theory that didn't work", with appropriate adjectives thrown in for good measure.

So far, this hasn't affected adversely the temperature of the concrete mix, because cooling by immersion of the coarser rock has been so effective as to be uncanny.

One other change is contemplated. A bull gear from a former job will be installed on one of the Koehring 4-yard mixers which were used on Friant Dam, and one new mixerbowl will replace another mixer from Friant.

Extensive study and consideration is behind the changes. The revised plant is now delivering the performance which was planned originally for the one installed.

Aggregate Production

Aggregate production at Bull Shoals Dam is a rambling, complex operation. The quarry is a big undertaking by itself. The 7-mile conveyor line was a triumph of construction work. The rock production plant at the dam is as modern as present-day equipment can make it. The story of rock production therefore begins at the quarry and ends with the finished aggregate stockpiled and ready to pass through the cooling plant.

A "Tough" Quarry

Approximately 3,800,000 tons of limestone rock is being quarried near a high hilltop about a mile north of Flippin, Ark. The quarry location lies about 7 miles west of the dam. Many potential quarry locations were tested and rejected for failure to meet accelerated freezing and thawing requirements before the Flippin Quarry was finally selected.

By any standards, the Flippin Quarry is tough. It has been necessary to strip 1,500,000 cubic yards of clay, shale, and other overburden to get at the limestone. Almost 60 per cent of the total material moved consists of stripping.

Subcontractor M. E. Gillioz of Monett, Mo., moved approximately 770,000 cubic yards of the stripping. This consisted of clay, topsoil, and loose shale which could be broken up by a K-30 LeTourneau Rooter.

Gillioz' equipment fleet consisted of three Gar Wood scrapers pulled by Allis-Chalmers HD-19 tractors; three Super C Tournapulls; one Model C Tournadozer; one HD-19 tractor-dozer; one HD-14C tractor-dozer; and one Caterpillar D7. Most of the stripping was slow, painstaking work, because the solid quarry stone is cut by fissures and ravines. Odd-shaped blocks of material were removed and wasted in two dumps beyond the quarry limits.

The balance of stripping not removed by Gillioz is considerably tougher material, some of which must be drilled

(*Continued on next page*)

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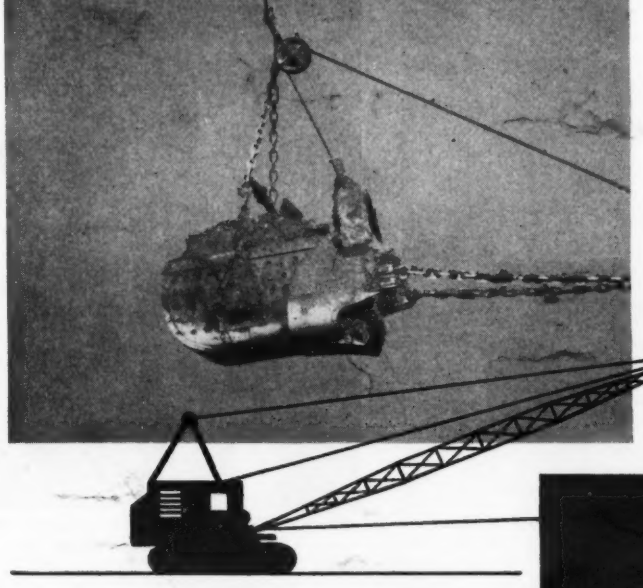
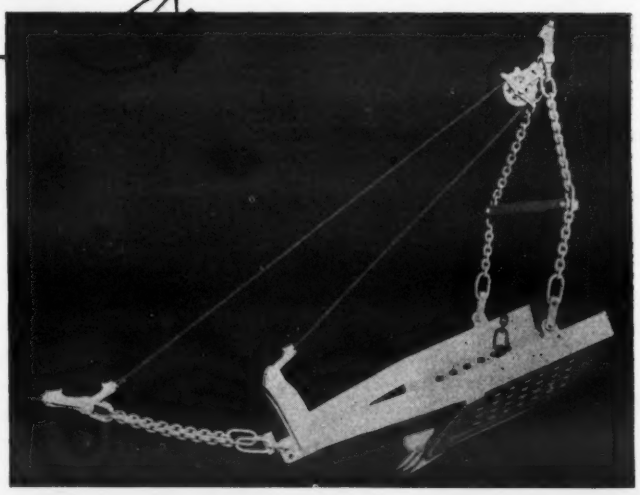


Yaun's Dragline Buckets—either solid, perforated or basket type—fill faster, dump cleaner and quicker because of their unique design and size-to-weight ratio. Engineered for perfect balance means easier handling for your operator. All buckets available in three weights: light, medium and heavy duty.



Yaun's "Contractor's Ditching Bucket" is another step forward in reducing costs for contractors. Scientifically designed, this bucket digs shallow wide sloping ditches in the sizes needed for the job. Available in sizes from ½ to 1 yard in medium duty weight. Write for full details on this new bucket.

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and shot. Flippin Materials Co. is doing this work with its own equipment. Where drilling of overburden is required, two Bucyrus-Erie 27-T blast-hole rigs, with 7-inch bits, are used. Broken stone, overburden, and shale are then loaded by a Lima 1201 power shovel and hauled away by three Euclid end-dump trucks. Later a 120-B electric shovel will do stripping during periods when no quarry rock is needed.

Now that the quarry face is fully developed, it is approximately 900 feet long, 80 feet high, and 800 feet deep. Three 29-T Bucyrus-Erie blast-hole drills are sinking the necessary 9-inch-diameter holes 27 feet back from the face. The holes are spaced 35 feet apart. Column-type shooting is the rule, using Hercules large-diameter stick powder and pulling the blasts with Primacord detonating fuse with an electric blasting cap at one end.

The broken stone is then loaded by a Bucyrus-Erie 120-B electric shovel into 4 Maxi-built Cummins-powered 25-cubic-yard side-dump trucks. There is little need for secondary shooting, because when the shovel finds a stone too big to go to the crusher, it casts it aside. A Northwest 6 crawler crane with a steel "skull cracker" then breaks up the piles of big stone occasionally, and a D8-mounted Caterpillar dozer pushes the remains over in front of the shovel dipper.

Passes Through First Crusher

The first step in the ultimate reduction of the limestone rock to size is made at the quarry. It is made by crushing and screening equipment designed to break the rock down to 6-inch minus. The plant consists of crushers, scalping screens, and necessary belt conveyors to carry the rock between the machines.

The big 25-yard side-dump trucks pull up in a direct line to the feeder hopper, the center of which contains a 42-inch Allis-Chalmers-driven Superior-McCully gyratory crusher. This heavy machine takes an entire 25-yard load at one gulp, breaking huge rocks and turning them out at a high rate of speed.

A 42-inch belt conveyor takes crushed rock from this first unit up to the screening plant, where two triple-deck Simplicity vibrating screens classify the material. The top deck of each screen is 6-inch, which scalps off the oversize. The bottom deck is fine enough to separate dirt and excess fines, where they can be shunted off to a waste pile. Occasionally, in good material, these fines are sent on to the dam.

Oversize stones from the scalping screen pass on to a 30-inch Superior-McCully gyratory crusher, where they are broken down and sent back over the screens. This secondary crusher was put in the line as a stand-by in case the bigger machine broke down. It has already proved to be good insurance. The motor on the big crusher burned up and for two weeks, while it was being repaired, the smaller unit turned out broken stone. It, too, is powered by an Allis-Chalmers motor.

The crushed material which passes the 6-inch scalping deck but is retained on the ⅜-inch elongated screen is now ready for transportation to the dam. It passes from the plant over a 36-inch conveyor. A magnet mounted over this line picks out metal, stray pieces of welding rod, and the like which find their way to the belt. The finished rock dumps off the end of the conveyor line to a stockpile which, if coned up to the head shaft, will hold approximately 10,000 cubic yards. A tunnel underneath this stockpile has gates operated by air which permit the rock to be drawn off to the 7-mile belt conveyor for transportation to the dam.

The Long Ride

Stone passes from the quarry over a 7-mile conveyor to the dam. Since it is much easier and more efficient to service this line in the daylight hours, the belt usually does its rock transporting at night. Ample provision is made at the dam to hold a day's supply or more for the equipment there. A small maintenance crew patrols the entire length of the conveyor line each day. Men lubricate the idlers and check the electrical control equipment. There has been little trouble—except for lightning and its tendency to burn out coils on the low voltage side—since the controls were changed and the motor horsepower raised on several of the hardest flights.

Final Rock Processing at Dam

Final processing to size, as well as cooling and mixing, is done in a modern rock plant high up over the right abutment of the dam. The general layout of this plant was not affected appreciably by the changes. Original plans allowed plenty of room for the various units.

When the 6-inch-minus rock arrives

(*Concluded on next page*)

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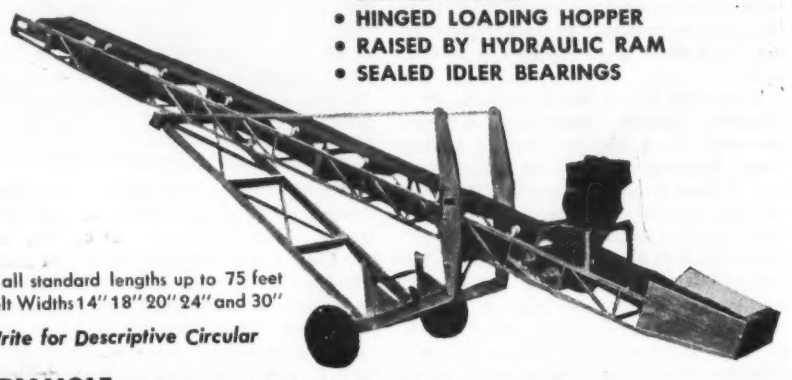

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IF IT'S A CONSTRUCTION JOB, IT'S A BLUE BRUTE JOB

Aggregate Production For Bull Shoals Dam

(*Continued from preceding page*)

from the quarry, it is dumped to a 10,000-ton live-storage pile. A 108-inch Armco Multi Plate culvert tunnel passes beneath this pile. Air-operated gates with solenoid control permit rock from this live-storage pile to pass to Screening Plant No. 1, over 310 feet of 36-inch belt.

Screening Plant No. 1 consists of a 5½-foot Symons cone-type crusher, powered by a 200-hp electric motor. Sizing features of this plant include two 5 x 12-foot double-deck Simplicity vibrating screens. Rock coming in over these screens separates. Large-size cobbles from 3 to 6 inches pass off over 170 feet of 30-inch conveyor to a 2,800-ton live-storage aggregate pile. A second size, from 1½ to 3 inches, passes over 170 feet of 24-inch belt conveyor to a 2,400-ton live-storage pile.

The remainder of the stone then passes through a 5½-foot Symons cone, which can if necessary also balance the stone piles by pulling some of the larger aggregates and routing them, too, through its crushing surface. When the rock has passed through this first screening plant, the two larger sizes of aggregate have been produced and stockpiled. Material which comes out of the Symons crusher then passes to Screening Plant No. 2, over 200 feet of 30-inch conveyor.

Screening Plant No. 2 consists of four 5 x 12-foot double-deck Simplicity screens, so arranged that two more sizes of aggregates can be separated and stockpiled. The ¾-inch to 1½-inch size passes over 200 feet of 24-inch conveyor line to a 3,500-ton live-storage pile. Finer aggregate, graded from No. 4 to ¾-inch, is stocked on a 4,100-ton live-storage pile over a similar conveyor line. The four live-storage piles, arranged in line, are tapped by a 108-inch Multi Plate tunnel with air-operated gates, and 610 feet of 36-inch conveyor takes these aggregates to the cooling plant as required.

At Screening Plant No. 2, however, the material which is to be used for the manufacture of sand is drawn off. This consists of two principal sizes: 1½ to ¾-inch, and No. 4 minus. Originally this material was all stocked temporarily in a weatherproof, covered pile which held about 2,000 tons. Now that the plant corrections are made, the No. 4 minus material is pulled out.

Material from the stockpile now passes between the raw-sand surge pile and the crusher plant over 290 feet of 24-inch conveyor. The material is again picked over for metal particles by a 24-inch Ohio electromagnet situated over this conveyor run. It then passes to the sand crusher plant, which houses two reversible-type Pennsylvania impactors, each powered by 150-hp motors. There are also 3 Cedarapids hammermill pulverizers in the line at this plant, each powered by a 200-hp motor. The function of these machines is to reduce to sand the larger sizes of limestone.

Crushed material from the sand crusher plant now passes over 195 feet of 24-inch belt conveyor to Sand Screening Plant No. 3. Here the sand is classified by four 4 x 12-foot Cedarapids sand screens, varying from No. 4 to No. 10 mesh.

The sand now passes over 195 feet of 24-inch belt to the Air Separator Plant, where excess fines are removed. This plant consists of 3 Sturtevant 16-foot Whirlwind centrifugal separators with 100-hp motors driving each machine. Three 18-inch conveyor lines, each about 300 feet long, carry the finished sand from the separation plant to a 3-bin stockpile. The sand is now graded to one size.

Five Roto-Clone dust collectors, Type D, Size 16, are strategically located to pick up dust around the plant. Each collector is powered by a 15-hp motor. Two of these machines are located at the Air Separator Plant, two at Sand Screening Plant No. 3, and one at the Sand Crusher Plant. The dust is discharged through a 36-inch-diameter dust-collector exhaust stack.

When the material has passed through the entire plant as outlined, it is in stockpiles just outside the cooling plant, ready to be brought in. The cooling phase of the Bull Shoals concrete operation is detailed in the companion article on page 25.

Many Joint-Venture Firms

Administrative and operational difficulties are held to a minimum because Ozark Dam Constructors, builder of the dam, and Flippin Materials Co., supplier of aggregate, are both composed of the same joint-venture firms. Sponsored by Brown & Root, Inc., of Houston, the other firms are: Wunderlich Contracting Co., Jefferson City, Mo.; Peter Kiewit Sons Co., Omaha; Winston Bros. Co., Minneapolis; David G. Gordon, Denver; Condon-Cunningham Co., Omaha; Morrison-Knudsen Co., Inc., Boise; J. C. Maguire, Los Angeles; and the Charles H. Tompkins Co., Washington, D. C.

Personnel

The dam is being built under general supervision of the Little Rock District of the Corps of Engineers, with Col. T. A. Lane as District Engineer and John Kemple as Resident Engineer.

On the work described in this article, J. E. Quillan is Chief Electrician, R. B. McRae is Project Engineer, and the various subdivisions of the job are as follows: Joe Shawver, Quarry; Pat Ernest, Drilling; J. D. McCormack, 7-mile belt line; Pope Schoenberger, Classification Plant; and Joe Estes, Master Mechanic.

Ross White represents Brown & Root, Inc., on the project, as the sponsoring company.

In a small back office, or perhaps in a beat-up gray Ford coupe, a visitor may find one more man worth looking up if he looks hard enough. He can be found, invariably, where the work is. He will be dressed in faded khakis. There is likely to be mud on his shoes. There will be some kind of trouble somewhere close, and once in a while this man may offer a few words of advice, as he did last summer when after a 5-hour battle he helped to get a man out alive from the bottom cone of the sand pile.

He has built too many big dams like Grand Coulee and Friant for this article to lay any emphasis on titles. He wouldn't want it to. His name is Harvey Slocum.

Yeomans Bros. Appoints Norris

Yeomans Bros. Co. of Chicago has made Spaulding A. Norris Assistant Sales Manager of its Pump Division. Before accepting this position Mr. Norris was associated with William A. DaLee, Inc., Yeomans representative in Detroit.

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ONCE AGAIN, forms of Douglas fir plywood provide the smooth, fin-free, easily-finished surfaces which make plywood a preferred material for such work. Close to three million square feet of these modern panels—Exterior fir plywood and plastic-faced plywood—are being used on the huge Parklabrea apartment development in Los Angeles.

Architects Leonard Schultze and Associates "consider the results amazing."

Parklabrea is another example—a *big* example—of plywood's ability to do a better form job, faster and with less labor. "The plywood produces smooth surfaces, ready for painting. Large size and light weight speed the work, and multiple form re-use reduces costs. There are far fewer joints to rub and grind."

New construction at Parklabrea—giant Los Angeles apartment project of the Metropolitan Life Insurance Company—will add eighteen 13-story apartment units, seven 2-story block-long concrete garages and several 2-story apartment structures. Completion of the new $40,000,000 section will provide 2,937 additional apartments, increasing the total number to 4,257 apartments capable of housing about 13,000 persons. Architects are Leonard Schultze and Associates, New York, represented in Los Angeles by Gordon B. Kaufman and J. E. Stanton. Starrett Bros. and Eken, Inc., New York, are general contractors.

Douglas Fir Plywood

AMERICA'S

A New Tractor Tool; Ripper and Trencher

A new hydraulically controlled ripper, trencher, and pipe-laying machine has been designed for use on Caterpillar D4 and Allis-Chalmers HD-5 tractors by A. S. Kinsinger, contractor of Gordonville, Pa. He plans to make these units available on a national basis. They are made to fit the same four pins that are used for front-end loaders, and are controlled in the same manner as other hydraulic attachments.

Having a free vertical play, the unit can be used for rooting in the hardest soils at depths of 30 inches, Mr. Kinsinger points out. The controlled downpressure makes it useful for breaking ground, uprooting rock, and pulling stumps. To use it as a pipe-laying machine for small-size flexible pipe, Mr. Kinsinger suggests pulling the ripper through the ground once or twice, making sure that the way is clear, and then attaching the pipe to the bottom of the specially designed shoe and pulling it into place. He reports that copper and steel pipe from ¼ to 4 inches in diameter can be laid to a 30-inch depth this way.

Ripper, trencher and pipe-layer all in one. A. S. Kinsinger, contractor of Gordonville, Pa., designed this hydraulic tool for use on Caterpillar D4 and Allis-Chalmers HD-5 tractors. It is planned to make the units available on a national basis.

Another trenching shoe is also available for opening a 2-foot trench with this machine. The change is accomplished in a few minutes by simply removing the two bolts that secure the shoes.

Further information on this new tractor-tool may be secured from Mr. Kinsinger. Or use the Request Card at page 16. Circle No. 140.

Cooling Aggregates At Bull Shoals Dam

(*Continued from page 25*)

piles outside, and discharged by means of a 40-foot shuttle conveyor into each of the 8 silos. This shuttle conveyor required much time and ingenuity to perfect. It will run either way, turn either way, and serve all the tanks. Its base is a circular railroad rail, set flush with the platform at the top level of the tanks. It is electric-motor-driven.

Prior to the filling of any silo with aggregate, it is partially filled with chilled water. When the silo has its load of aggregate, the pumping system goes to work, circulating continuously chilled water through the charged silo in an 8-inch pipe-line system. This operation is flexible. Temperature of the water and the period of inundation can be varied, permitting changed control of concrete temperatures.

It requires about 10 minutes to fill each silo with coarse aggregate. As soon as one silo is filled with rock, the circulating pump is started, causing a continuous flow of chilled water through the silo of aggregate. As each silo is filled consecutively the circulation is started by the manipulation of valves. When a predetermined time of cooling by the flow of chilled water has been reached, the circulation is stopped, the silo is drained, and the same cycle of operation is started in the other row of 4 silos.

After a short period of draining, the first 4 bins of aggregate are individually discharged to a conveyor belt located immediately under the discharge gate of the silos. This conveyor transports the drained and cooled aggregate to a hopper and chute directly over a 5 x 10-foot curved double deck Deister vibrating screen. In passing over the screens the excess water is removed from the aggregates, collected in a huge pan, and diverted to a wastewater line. An air-water jet flushes the aggregates through a spray bar installed for that purpose as they pass over the vibrating screens.

The aggregates then pass into a collector hopper, thence down the main conveyor line which immediately transports them into the aggregate bins above the batchers in the mixing plant.

For a concrete-placing rate of 320 cubic yards an hour, approximately 440 tons of coarse aggregate have to pass through the chilling operation. This rate of placing will permit, roughly, a 2-hour cycle for each bank of silos. This is ample time for the cooling and draining part of the process.

A 50-minute cycle, considerably below the theoretical one, has proved possible in practice, according to the operators of the plant. Tests made by drilling into the center of a piece of 6-inch rock, inserting an electrical thermometer, and filling the hole with mortar before immersion showed a drop from 70 to 34 degrees F in the center after only 28 minutes of immersion.

In order to maintain the low temperature of the aggregates while being transported and stored in the overhead bins at the mixing plant, provisions have been made to maintain at low temperature the storage and transfer areas for aggregates. An insulated building has been built to inclose the overhead bins at the mixing plant, and an insulated inclosure was also constructed for the main aggregate conveyor line from the cooling plant to the mixing location. An air-conditioning unit has been installed in the cooling-plant building. It circulates cooled air throughout the areas where chilled aggregates are handled or stored.

Original sand cooling was handled by two heat exchangers. Each consisted of 327 flues 3 inches in diameter x 10 feet long. As sand passed through the flues, 35-degree water was circulated

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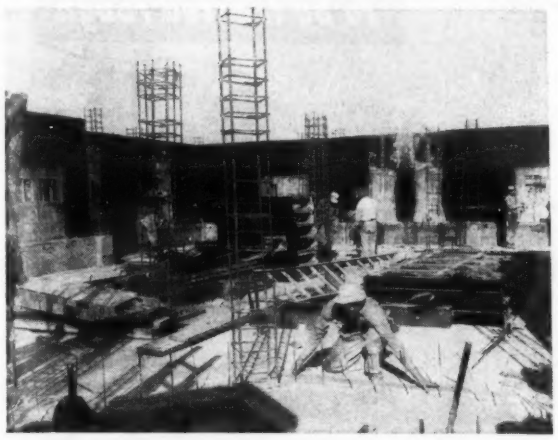
Re-Use Another Feature; Only One Set of Plywood Forms Needed for Each Building!



Form reconstruction during pouring operations on each 13-story structure was eliminated; one set of plywood forms gave enough re-uses to complete the job! As pouring progressed, plywood forms were moved up in sections. Nearly a million square feet of plastic-faced plywood formed exterior walls and interior ceilings. Two million square feet of Exterior-type plywood was used for interior walls, foundations, stairwells.

Plastic-faced plywood formed the smooth, blemish-free surface for this ceiling—with only a paint surface needed to finish the job. Ceiling is the underside of a 7-inch thick reinforced concrete slab floor, poured against ⅝-inch panels, nailed to 2"x4" joists, 24" on center, with 4"x4" wales, 4' on center.

Large, Light, Strong *Real Wood* Panels

For additional data on Douglas fir plywood for concrete form work, see Sweet's File, Architectural, or write (USA only) Douglas Fir Plywood Association, Tacoma 2, Washington. Of particular interest are two booklets: "Concrete Forms of Douglas Fir Plywood" and "Handling PlyForm."

BUSIEST BUILDING MATERIAL

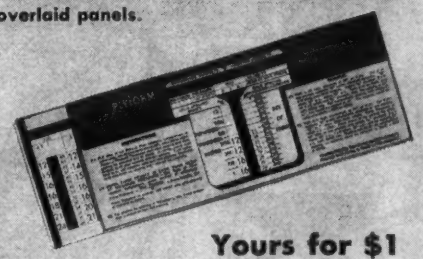
For Smooth, Fin-Free Concrete Surfaces...

PLYFORM

Concrete Form Panels

GENUINE DOUGLAS FIR PLYWOOD PLYFORM CONCRETE FORM PANEL INTERIOR-TYPE GRADE B-B D.F.P.A. INSPECTED

Smooth, fin-free surfaces . . . ease of handling . . . strength, rigidity, tightness . . . superior nail holding qualities . . . cost-cutting re-use factors—these are primary advantages of PlyForm. Highly moisture-resistant glues used in PlyForm panels permit multiple re-use (as many as 10 to 15 are not unusual). For greatest possible panel re-use, however, specify Exterior-type Concrete Form grade of Douglas fir plywood. For special architectural concrete and the smoothest possible surfaces—as in the Parklabrea job—specify Exterior or Interior-type plywood in grades having "A" face veneer, or one of the new plastic-overlaid panels.



Yours for $1

New Keely PlyForm calculator gives construction data for plywood forms, based on hourly rate of pour. Complete with leaflet, "Design Assumptions for New Keely Calculator." Send coupon now!

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TACOMA 2, WASHINGTON (Good in USA only)

Please send me ..... Keely Calculators. I enclose $1.00 each to cover costs.

Name.....

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City.....Zone.....State.....

Cooling Aggregates At Bull Shoals Dam

(*Continued from preceding page*)

around them. As stated, in the companion article on aggregate production, the rate of flow could not be regulated to permit cooling. The entire idea turned out to be as queer as a $3 bill, according to Harvey Slocum, and he emphasized it was a mistake which no one should repeat.

Refrigerating Equipment

Refrigerating equipment is housed in the ammonia-compressor building. It consists of 3 Vilter ammonia compressors 15 x 15 inches, with a total available refrigerating capacity of 1,689 tons at 40-pound suction pressure. Approximately 417 tons of this capacity is allocated to the cooling of water for forced circulation through the finished concrete monoliths. About 900 tons is needed for aggregate cooling, and the balance of 372 tons takes care of air conditioning, unpredictable losses, and stand-by. Seven Vilter condensers are also in this building.

The tin building 60 x 55 feet also houses air compressors. There are three machines producing 6,500 cfm—two Joys and a Chicago-Pneumatic which furnish field air to the dam. An Ingersoll-Rand stationary compressor furnishes air to the batch plant for use in opening the ram gates and the like.

The water cooling tank has a capacity of 45,000 gallons. Water in this reservoir is chilled by direct refrigeration. Part of the heat is also dissipated by circulating the water through a spray pond, where fine jets are exposed to the air.

Concrete Mixing Plant

The concrete batching and mixing plant at Bull Shoals Dam is, like some of the key men there, a veteran of dam construction. It is the same plant which mixed the concrete for Conchas, Friant, and Dale Hollow Dams. Only slight revisions have been made for the present job.

The plant consists of a fully automatic C. S. Johnson batcher, which has enough bin capacity to store materials for about 125 cubic yards of concrete. On a secondary platform below the batch machinery are 4 Koehring 4-yard tilting concrete mixers. Material, properly proportioned by the Johnson plant, drops down to these mixers, where it is agitated 1½ minutes. It is then dropped direct to 4-yard placing buckets on railroad flatcars which come in below the mixers. It can easily be visualized that the concrete plant is a big, high structure.

Some 100-pound-air-pressure controls have been installed on the batch plant to replace the original 50's, but with that exception the plant is about the same as it was at Friant. A great deal of rebuilding was necessary one day early last spring, when an oil heater was overturned and the plant caught fire. Before the blaze was extinguished, the top of the plant around the batch bins had burned, and the aggregate conveyor line with its steel tower supports had crumpled to the ground. Men worked for 20 days and the plant was again in operation. Fortunately there had been no damage to automatic controls or weighing mechanism.

The incoming aggregate is not at all abrasive to the inside of the mixers, but it is quite hard on the rest of the plant. When heavy 110-pound steel railroad rail baffles were installed over the bins to break the force of the aggregate, they wore through in only 4 weeks.

Both portland and natural cement are being used. The latter is hard to handle because it is so fine, but screw conveyors move it if the operators take it slow and carefully. At the present time one of the popular mixes is a 4.25-cubic-yard batch. Its proportions are:

Portland cement	900 lbs.
Natural cement	277 lbs.
Water	824 lbs.
Rock, 6 to 3-inch	3,857 lbs.
Rock, 3 to 1½-inch	3,973 lbs.
Rock, 1½ to ¾-inch	1,637 lbs.
Rock, ¾ to ¾-inch	2,220 lbs.
Sand	3,866 lbs.

The efficiency of refrigeration at the project can also be illustrated by quoting an average test made at the mixing plant while the project was visited. With an ambient outside air temperature of 79 degrees, the various concrete components showed the following:

Rock, 6 to 3-inch	43 degrees
Rock, 3 to 1½-inch	43 degrees
Rock, 1½ to ¾-inch	48 degrees
Rock, ¾ to No. 4	42 degrees
Sand	77 degrees
Portland cement	116 degrees
Natural cement	90 degrees
Water	36 degrees

All things considered, the concrete manufacturing technique at Bull Shoals Dam is one of the most complete of any project under way at this time.

Author's Note: The author acknowledges with thanks the paper "Inundation Method of Cooling Aggregates at Bull Shoals Dam," by Roy F. House, which was presented at the Kansas City Concrete Conference and used in part in the preparation of this article.

Chemical Treatment Of Roadside Brush

For chemical brush control on roadsides and right-of-ways, the Agricultural Chemicals Division of the American Chemical Paint Co., Ambler, Pa., has developed Weedone Brush Killer 32, a combination of 2,4-D, and 2,4,5-T. Designed to emulsify with water, oil, kerosene, or water-oil mixtures, Weedone is said to be an effective killer of woody plants. Circular 750-B, issued by the company, indicates the proper time and method of application, and describes the equipment and amount of chemicals to be used. This killer can, of course, be used with high-volume, knapsack, or low-volume sprayers.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 43.

NUTS to STICKING CONCRETE—

An occasional application of POWERFILM to concrete forms, mixing equipment, trucks, tools, wheelbarrows and all other concrete handling equipment keeps concrete from sticking tightly to the surface, thereby making it easy to clean with a hose and water.

POWERFILM is a rust preventive. POWERFILM will keep *Mason's Tools* bright and clean, and free from rust. POWERFILM will displace water, so that equipment need not be completely dry when it is applied.

Priced $2.67 per gallon, freight paid in quantities of 15 gallons or more. ($2.89 west of Rockies.)

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The Thomas Company, 1645 Hennepin Avenue, Minneapolis 3, Minn.

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GAR-BRO *Power-cart*

HANDLES MORE THAN 3 CARTS!

TRAVELS 3 TIMES AS FAST!

NEVER TIRES!

HANDLE BIGGER LOADS faster with a GAR-BRO Power-Cart and save money. Here's power, speed and capacity to move 14 cu. ft. or 2000 lbs. of material up 20% grades or over rough, uneven ground at speeds up to 15 miles per hour. Turn within 4 ft. radius; practical on 5-ft. ramp or runway. Dumps the load fast with a trip-latch or pours slowly when controlled by the convenient tilt-brake on the concrete tray. Has all welded steel construction—no castings to break.

The GAR-BRO Power-Cart is available with concrete tray, box tray or platform—they are interchangeable. Get the facts now!

TOUGH ENOUGH to be treated rough

Heavy-duty Buckets (13 Models). Cap. from ¼ to 8 cu. yds.
Collection Hoppers (10 Models) with variety of discharges.
Light-weight Buckets (4 Models). Cap. from ½ to 1 cu. yd.
Transition Chutes of various types.

WRITE FOR CATALOG TODAY!

GAR-BRO Construction EQUIPMENT
Laydown Concrete Buckets (8 Models) for use with transit mixers. Cap. from 1 to 5 cu. yds.
Concrete Floor Hoppers (20 Models). Cap. from ½ to 10 cu. yds.
Hoppers, portable and semi, (8 Models). Cap. from 2 to 4 cu. yds.
Power-Cart handles 12 to 14 cu. ft. at 6 to 8 miles per hr. Turns in 4' radius.
Shovel Barrows (2 Models) with fulcrum-type foot pedal to elevate and dump load.
Weigh Hoppers and Bin Gates in all sizes and types.
Wheelbarrows (25 Models) of all styles with wood or steel handles.
Concrete Carts (6 Models) cap. 6 to 8 cu. ft.
Two-wheel Barrows (6 Models) of all styles.
Tower Buckets (5 sizes). Cap. from 8 to 36 cu. ft. Chutes available.
Special Concrete Handling Equipment built to your specifications.

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DEALERS EVERYWHERE

The Dump-All body fits Ford or Ferguson tractors and operates on their hydraulic systems.

New Tractor-Mounted Hydraulic Dump Body

The new hydraulic Dump-All adapted for Ford or Ferguson tractors has recently been announced by the Fleischer-Schmid Corp., Columbus, Nebr. With a carrying capacity of 2,000 pounds, the Dump-All operates on the tractor hydraulic system and requires no additional equipment, according to the company. Empty or loaded, the Dump-All can be raised or lowered, stopped or held, and has a tilting range up to 35 degrees for fast unloading.

The Dump-All sits snugly on the tractor with no overhanging sides. The unit is 60 inches long, 56 inches wide, and 22 inches high. It is of one-piece all-steel construction. Two pins hold the box on its frame for rapid changing from one implement to another. The end gate is fastened by heavy hinges. The Dump-All does not interfere with the use of a belt pulley or drawbar. The company points out that when the box and lifting mechanism are removed, any other implements requiring use of the hydraulic system may be operated without interference from the Dump-All frame.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 141.

Pocket Slide Rule Calculates Torque

A new on-the-job slide rule for calculating torque loads on flexible-shaft equipment has been developed by Stow Mfg. Co., 400 State St., Binghamton, N. Y. It solves torque problems and indicates the size of shaft required at a given rpm within a given radius.

This handy pocket-size calculator is available to design engineers and business executives who are confronted with power-drive problems. It may be obtained by writing, on company letterhead, to Stow. Or use the Request Card at page 16. Circle No. 13.

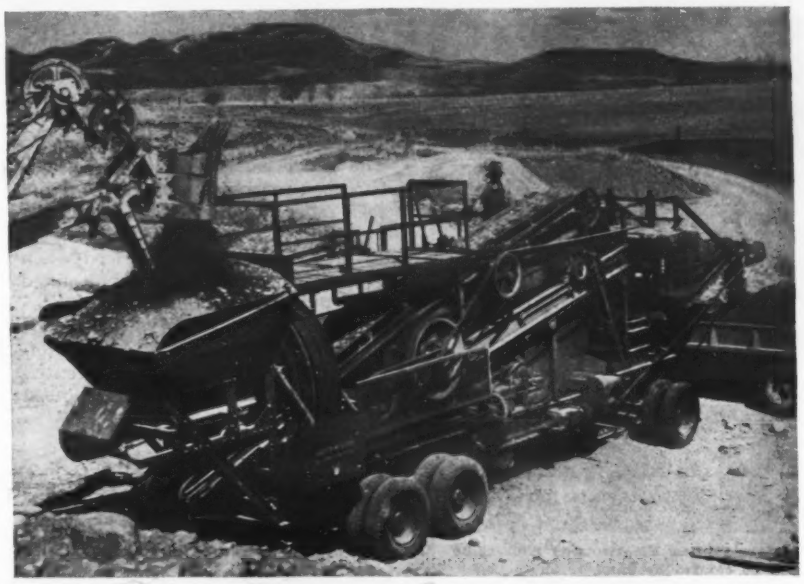
Portable Crushing And Screening Plant

The new 201 Austin-Western portable crushing and screening plant is designed to produce ¾-inch and smaller stone. Manufactured by the Austin-Western Co. of Aurora, Ill., the new unit has both jaw and roll crushers and is of such size and weight that it can be transported over most highways without a special permit. The 201 may be had with either a shovel-loading hopper or a swivel drive for a separate feed conveyor. The shovel-loading hopper is fitted with an inclined grizzly and a mechanical feeder. All principal units are shaft and V-belt-driven. Brakes are fully enclosed and all moving parts are protected by guards.

This new plant requires an 85 to 110-hp engine for operation. The engine can be mounted on the plant and transported without being removed; or, if preferred, the plant can be driven by flat belt or propeller shaft from a separate power unit or tractor. The rear end of the plant is carried on four wheels, each with dual tires. The plant has an overall width of 8 feet. All bearings are of the anti-friction type.

While intended primarily for operation on gravel, it is said to perform equally well in quarries when combined with a wide-opening jaw crusher set to deliver a 3 or 4-inch product to the 201.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 98.



Austin-Western's 201 portable crushing plant at work in Gem County, Idaho, producing approximately 100 tons per hour of ¾-minus road gravel.

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Ruggedly-Built
PILE EXTRACTORS

Provide exceptional pulling power, with the sharp energy of blow needed to vibrate and loosen stubbornly set piling. These double-acting extractors come in two standard models—heavy and extra heavy. Standardized line also contains 10 double-acting hammers and 5 single-acting hammers. Write for free Bulletin.

Also builders of coal and ore bridges, bulk material unloaders, bridge operating mechanisms, hoists and marine equipment, and specially designed machinery.

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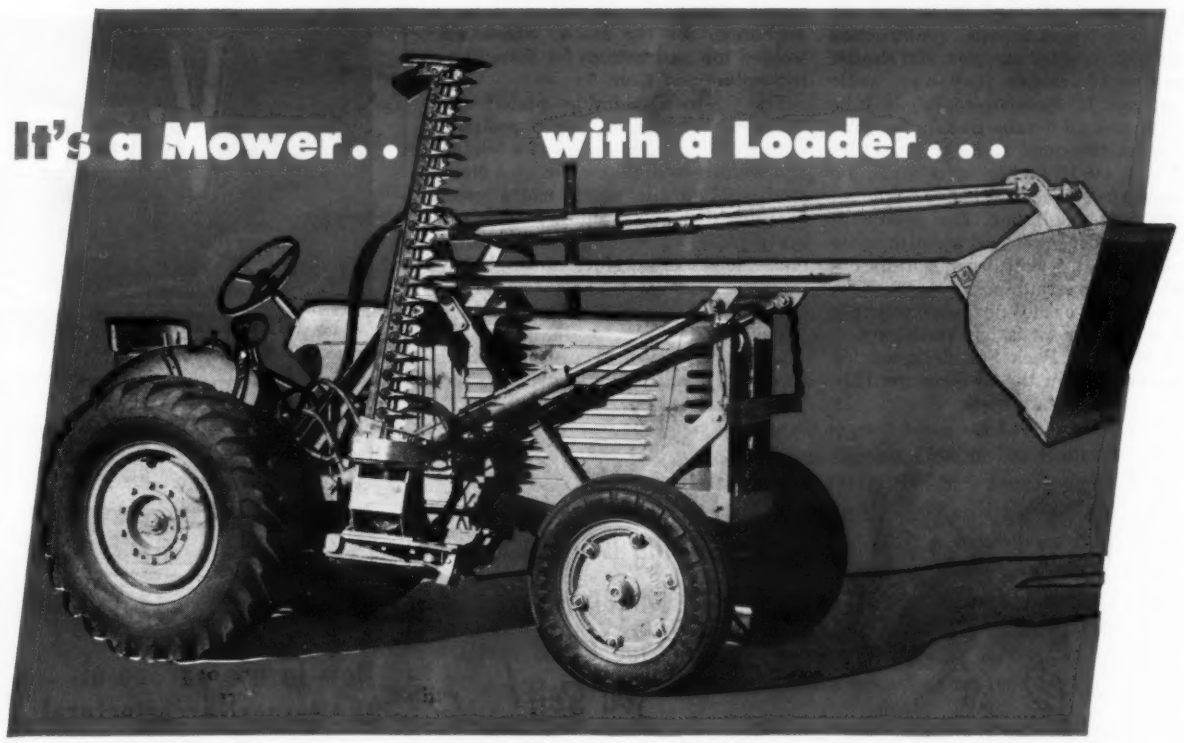
Manufacturing Engineers, 19 Park Row, New York 7, N. Y.



It's Your Cost-Cutting Combination!

Here's how to really step up the usefulness and profit-making ability of your Oliver Wheel Tractor-Loader. Simply add an Oliver Hydraulic Mower and you get a cost-cutting combination that will be busy virtually all year round. You can install the mower quickly and easily for those few days or weeks of work per mowing month . . . pull it off for the regular run of loading jobs. It's the ideal combination to cut your operating costs.

This powerful mower fits right into your tractor-loader. Cutter bar is driven by the hydraulic pump of the loader so no separate power units are required. Mower will cut anything from thick matted grass to moderate brush—in fact, almost anything that will pass between the knife guards. Hydraulic safety mechanism practically eliminates knife damage. Operator can cut right up to an obstruction . . . hydraulically raise the cutter bar to clear the obstruction...go right on mowing.

For all the facts on this cost-cutting combination that gives you year-round work with a tractor-loader-mower economically, see your Oliver Industrial Distributor or write us direct.

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Industrial Division: 19300 Euclid Avenue, Cleveland 17, Ohio
A complete line of Industrial Wheel and Crawler Tractors

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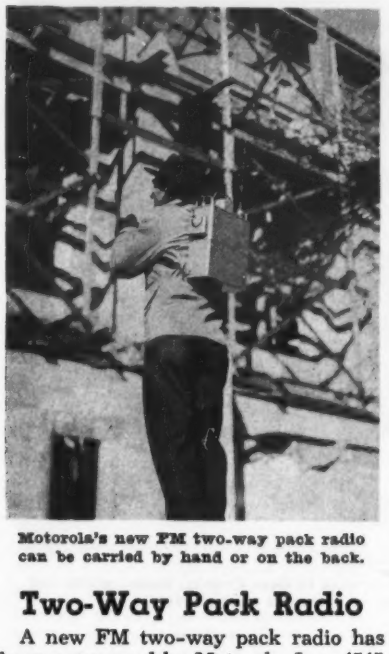


Motorola's new FM two-way pack radio can be carried by hand or on the back.

Two-Way Pack Radio

A new FM two-way pack radio has been announced by Motorola, Inc., 4545 Augusta Blvd., Chicago 51, Ill., for use by highway departments, construction companies, forestry services, and similar operators of mobile two-way radio equipment. It incorporates a 16-tube receiver and an 8-tube transmitter into a compact 19-pound radio station, 10½ x 15¼ x 4 9/16 inches, which can be hand-carried, back-carried, or used as a semi-fixed installation. Equipped with a tip-up loudspeaker and an adjustable squelch circuit, it will broadcast directly over the operator's shoulder when back-carried, or to near-by working areas when the set is left stationary.

The Motorola Pack Set, designed for operation in either the 25-50 or the 152-174 mc band, is available in three versions: single-frequency transmitter and receiver; two-frequency transmitter, single receiver; and dual transmitter, single receiver. All are complete with batteries, antenna and microphone.

The unit is said to operate from pack set to pack set with a nominal range of 2 to 5 miles; from pack set to mobile unit with a range of from 7 to 10 miles; with greater ranges experienced when operating from aircraft or with fixed base stations. Ranges depend upon relative antenna height and physical obstructions.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 64.

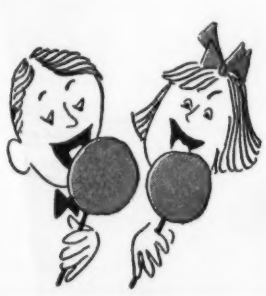
Welded Studs Fasten U.N. Window Frames

The glass east and west walls of the United Nations Secretariat Building are outlined and divided by floor-to-floor aluminum window frames fastened with welded studs. Short steel I-beam sections cast in the concrete and extending through the slabs serve as anchorage for the studs, which were welded top and bottom for fastening at the ceiling and floor.

The ½-inch cadmium-plated studs used for the purpose were positioned on the ceiling with the aid of a template and welded to the inserts with a Nelson stud-welding gun which had a special adaptor; then the window frames were set in place. The studs for fastening at floor level were welded through holes in the anchorage brackets already attached to the frames.

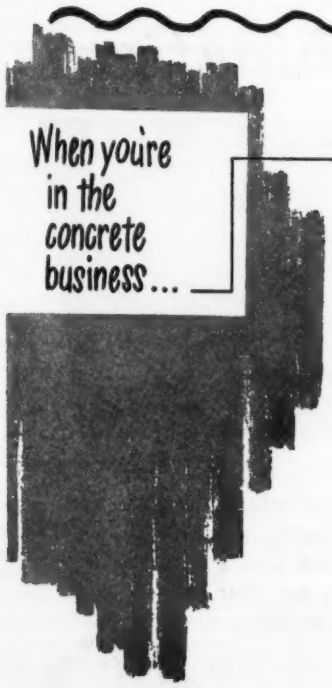
This method of fastening was accepted by Harrison & Abramovitz, the architect, and Fuller-Turner-Walsh-Slattery, Inc., the builder, on the recommendation of General Bronze Corp., which fabricated and installed the windows. The welded fasteners eliminated the necessity for drilling and tapping approximately 50,000 holes for window-frame anchorage.

At left, a ⅛-inch cadmium-plated stud is welded to a short steel I-beam insert in a concrete floor slab to provide anchorage for the floor-to-floor aluminum window frames of the United Nations Secretariat. Above, a completed section.



When you're selling lollipops the longer they last the more you sell!

When you're in the concrete business...



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Please send free booklet "The Facts on the Modern Placement of Concrete through Air-Entrainment."

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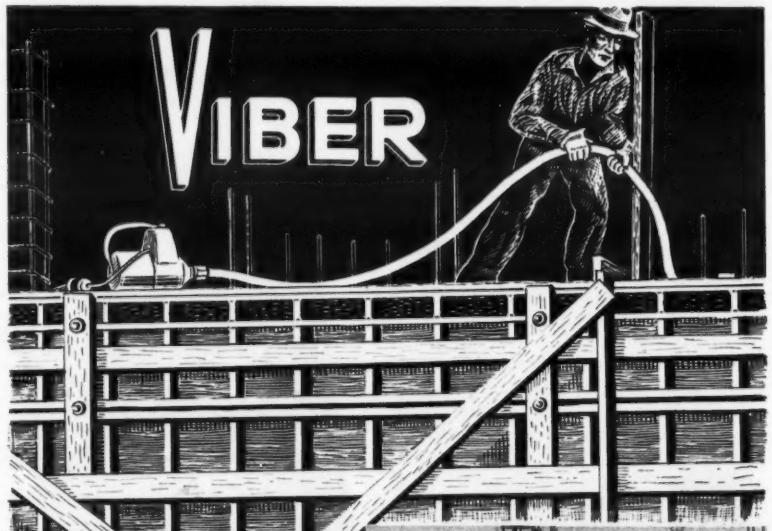

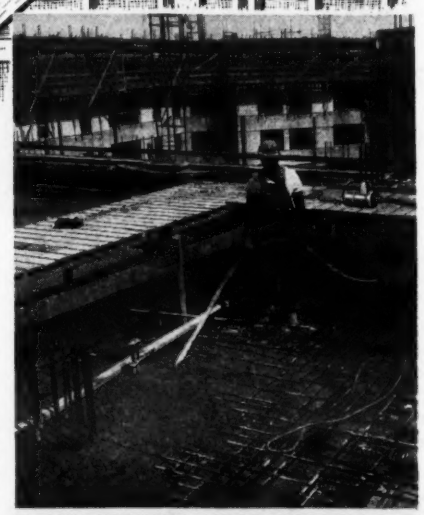

Now in use on one of the largest architectural concrete construction jobs in the United States

New architectural and engineering techniques are being pioneered on the Metropolitan (Parklabrea) Housing Project in Los Angeles.

VIBER SELECTED...One of the five unusual features of this tremendous project is an effort to reduce time, effort and costs in concrete placement operations. The exclusive use of Viber equipment on a project that is testing new construction methods and techniques illustrates the regard engineers and construction men have for this interchangeable line of concrete vibrators.

VIBER RUBBER TIPS...Viber's development of rubber tips has reduced damage to expensive forms....an important phase of architectural construction costs.

GOVERNMENT AND RESIDENTIAL HOUSING...The vast program of Government and residential housing now in planning and process is just one of the fields in which Viber plays an important roll.

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$40,000,000 Parklabrea Housing Project, Los Angeles

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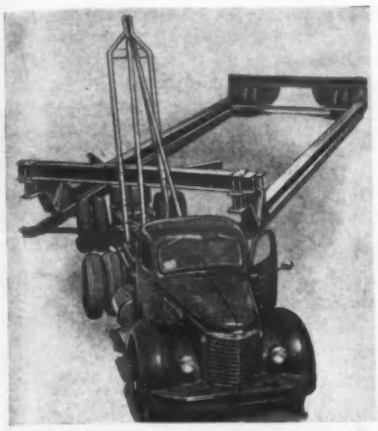


The Schuette 50-ton-capacity Super-Hauler has an adjustable frame and is assembled under the load to be moved.

Adjustable Trailer Handles 50-Ton Loads

A new heavy-duty adjustable-frame trailer for moving houses, large and awkward pieces of equipment, or burdensome prefabricated structures weighing up to 50 tons has recently been offered by the Schuette Builders Co., Wausau, Wis. The three-point suspension of the Super-Hauler prevents load shifting and distortion, and its adjustable frame provides balanced support, according to the manufacturer.

Constructed on the unit principle, with five basic elements, the complete trailer is assembled under the load to be moved. Main frame girders are separate units and are placed in any desired position under the load after clearance is provided. This flexibility of assembly means that the heaviest section of a structure can be amply supported at its critical weighted point, the company says.

Once the trailer frame has been placed under the load, the complete frame and burden are raised in a single effort, with no movement of the load relative to the trailer. Then adjustable pneumatic-tired wheels are positioned on the trailer cross beams.

Trailer design incorporates a three-point weight distribution, made possible by using a semi-trailer type of fifth wheel on the front crossbar section of the trailer frame. This shoe rocks laterally at right angles to the frame to permit the right and left rear wheels to rise and fall without excessive distortion to the frame. The front wheels have a rigid metal tongue which hitches to a standard 3 to 5-ton truck. Because the front wheels can pivot 180 degrees on the fifth wheel, comparatively short turns and easy trailer manipulation are possible. If full lateral movement of the load is desired, small dollies are placed at right angles to the rear wheels on the frame girders. The rear wheels are then removed. Thus with the front wheels turned 180 degrees and the dollies in position, the load can be moved sideways.

Front and rear wheels can be removed completely, in which case the frame girders simulate an ordinary heavy-duty steel skid to which an overhead crane, derrick, or gantry can be attached. This facilitates the erection of difficult-to-handle structures such as large electrical transformers, hydro-electric generators, water wheels, and heavy metal-working equipment.

The main trailer is made up of frame girders supplied in lengths to 44 feet, and trailer cross beams, or cross members, furnished in widths to 22 feet. Load height above the ground is 26 inches. Dual heavy-duty rear wheels with standard pneumatic truck tires are mounted on the rear cross beam and have mechanical brakes operated from hand levers. The front wheels have air brakes operated from any standard truck braking system.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 15.

New Support Column An Integrated Unit

A device for supporting columns in light construction has recently been announced by the Akron Products Co., Seville, Ohio. It is a dual-purpose steel post, which acts first as an adjustable support column during the early stages of construction, eliminating temporary support installation, and eventually is embedded in the concrete floor as a permanent fixture.

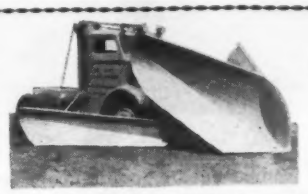
Called the Mono-Post, because it is a completely integrated unit with no parts to assemble, the support is made of 11-gage tube 3 inches in outside diameter. The 7-foot post weighs about 40 pounds. The assembly includes welded plates at the top and bottom and a precision-built jack used to make periodic adjustments during early construction stages. The post is made of Perma-Tube, a plastic-coated steel tubing produced by Jones & Laughlin Steel Corp. of Pittsburgh. A relatively high-strength steel, it is said to be comparable to aluminum in appearance and ability to resist corrosion.

The jack is first attached to a footer. After adjustments on all supports have been completed, the base plate, the jack, and about one inch of the Perma-Tube post are embedded in the concrete floor.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 153.

Euclid Transfers Malmberg

Euclid Road Machinery Co., Cleveland, Ohio, has made Edward A. Malmberg Sales Engineer for its Export Division. He is assigned to the Far Eastern Territory which includes Indonesia, Malaya, India, Pakistan, Siam, China, and Japan. Mr. Malmberg was formerly a special representative for the Sales Development Department.



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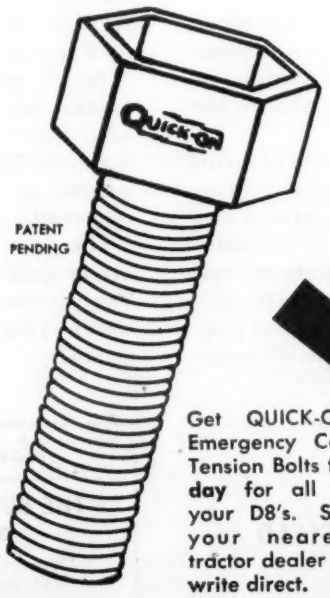

Get QUICK-ON Emergency Cap Tension Bolts **today** for all of your D8's. See your nearest tractor dealer or write direct.

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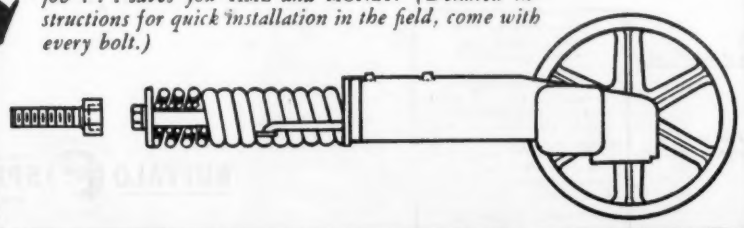
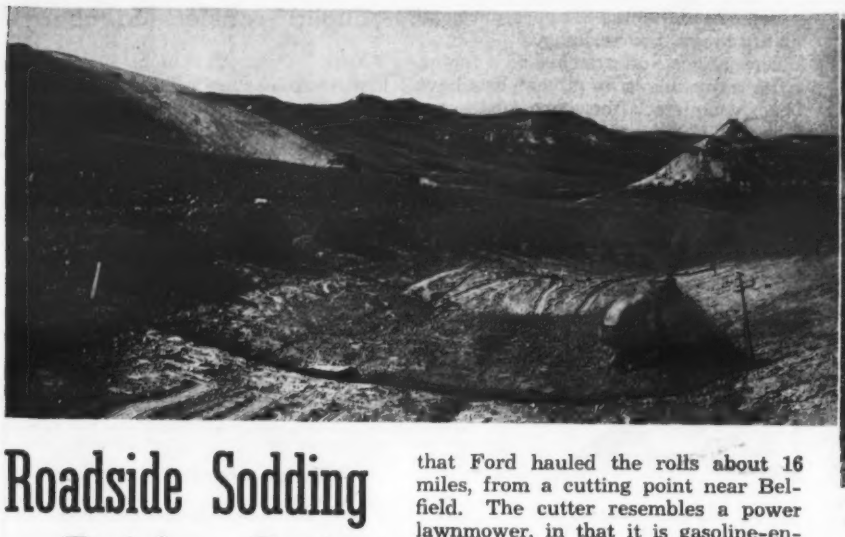
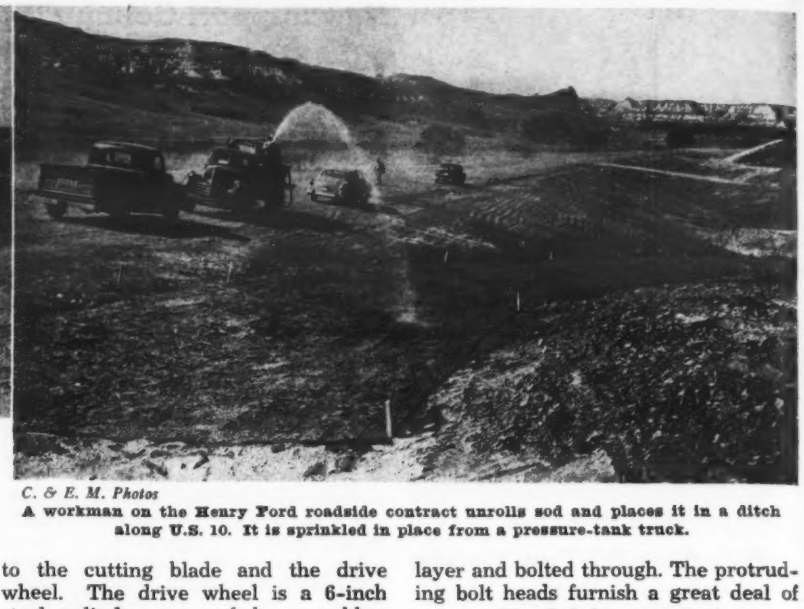


Silver Booster MANUFACTURING COMPANY

132 WEST VERDUGO AVENUE, BURBANK, CALIFORNIA





C. & E. M. Photos
A workman on the Henry Ford roadside contract unrolls sod and places it in a ditch along U.S. 10. It is sprinkled in place from a pressure-tank truck.

Roadside Sodding Finishes Project

Erosion Protection on Badlands Highway Job Included Sod and Grass Along New Roadsides

✦ DESPITE the fact that one of North Dakota's newest realignment projects cut through the badlands, the State undertook on this project a thorough job of erosion prevention along the new roadsides. With 5,140 square yards of new sod in ditches vulnerable to erosion, and over 104 acres of seeding, the North Dakota State Highway Department is taking no chances on the loss of soil.

The Henry Ford Co. of Minneapolis, Minn., did the roadside work, under a subcontract with Albert Lalonde Co. of Sidney, Mont., prime contractor on the new $349,660 project. (See C. & E.M., Feb., 1950, pg. 18.) Ford is no relation of the man in Detroit who invented the tin lizzie.

Ford has perfected his own power cutter to take up sod, and improved models of his machine will now cut as much as 9,000 square yards per day. "Per day" to Ford means the hours from dawn to dark in the middle of the summer, because that is the way he works.

Sod a Long Way Off

Sod is so scarce through the badlands that Ford hauled the rolls about 16 miles, from a cutting point near Belfield. The cutter resembles a power lawnmower, in that it is gasoline-engine-driven, has plow handles, and operates under its own traction.

The newer models have a 2-cylinder engine, hooked by a chain-belt drive to the cutting blade and the drive wheel. The drive wheel is a 6-inch steel cylinder, covered by a rubber layer and bolted through. The protruding bolt heads furnish a great deal of

(*Concluded on next page*)

Electroline
WIRE ROPE FITTINGS

The LAST WORD *in*
SAFETY SPEED SAVINGS

No heat, acids or complicated equipment required for installation. Ordinary mechanic's tools do the job, safely, even in chemical plants, powder plants and mines, where other methods would be prohibited. And they are safe to use, because they have the highest holding strength of any known wire rope or strand connectors. They assure *savings in installation* because unskilled labor can do the job easily and quickly; *savings in use* because they prolong wire rope life by damping vibration and overcoming rope fatigue at entrance to fitting . . . and because they are reclaimable.

Note ease of installation.

Simply slip the sleeve over the cable, spread the strands, insert and drive in the plug then apply the socket. See what a solid and permanent joint you have by looking at it through the inspection hole put there for the purpose.

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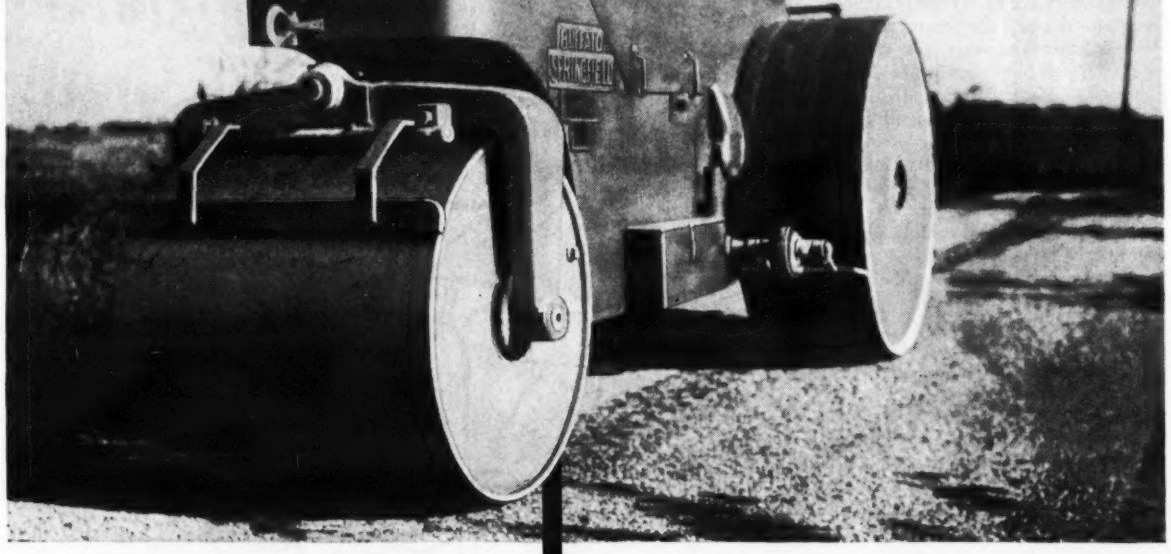
Electroline Company
4121 S. LA SALLE ST., CHICAGO 9, ILL.



WORKHORSE
3-Wheel Roller Style

Buffalo-Springfield variable weight 3-wheel rollers are work-horses by any definition. No longer single-purpose machines, these new units far outstrip "old Dobbin" in ability to perform many different jobs with efficiency and economy.

For example, the Buffalo-Springfield model VM-18 is basically a 5-ton machine—but that's not all. It can perform work calling for a 6-ton or even a 7-ton machine. The VM-18's wide job versatility is made possible by ballast type rolls. Heavy steel head plates, welded to the roll tires and hubs, form water-tight compartments. Filling and drain plugs in the outer heads permit filing the rolls with water to increase the roller weight. If even higher compressions are desired, shovel openings with bolted water-tight covers are provided so a mixture of water and sand can be used as the ballasting material. Thus—the VM-18 can be adapted to meet compression requirements that would *normally* call for three fixed capacity models.

Equally important, the roll surfaces are machine-finished for uniform smoothness and curvature, which means the VM-18 can also be used for finishing work. Thus, one variable weight 3-wheel roller is used for many applications and reduces the equipment requirements on any road building job.

There are seven Buffalo-Springfield variable weight models covering a range from 5 to 17 tons. Your nearest distributor can give you complete details on the model best suited to your needs. See him today.

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THE STANDARD OF COMPARISON
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traction. Small rubber tires carry the back end.

The cutting knife, about 12 inches wide, is sharpened to a razor edge and mounted underneath the machine on the connecting rods of eccentric-driven arms. Ford got the idea for this backward-forward movement from the old days, when he used to cut sod by hand knives and always had to back up a few inches to clear his blade. The plow handles, which hold the cutting arrangement on heavy springs, can be lowered quickly to increase the digging depth of the machine. By manipulating the plow handles right, the machine can be made to cut sod out of a ditch and start up the other side quite efficiently.

There is no operator fatigue, the machine seldom breaks down, and there is little maintenance. The only improvement on the newest of Ford's five machines is the use of a larger engine to carry the machine along.

The sod is rolled up in small rolls which are easy to handle. The rolls are not tied. They are handled with the loose end up. Each roll covers 9 square feet, making a square yard in each. State surveyors set the stakes for areas to be sodded, and Ford's men laid the material to string lines stretched between the stakes. Extreme care was used to make certain the edges match, and the sod was laid on a firm bearing. Hand raking prepared the base for sod.

Ford is a roadside contractor who realizes that sod can be cut too thick. Sod cut too thick will not take root very fast, and frequently heavy rains undercut it to the point where it must be replaced. Since Ford's contract called for keeping the sod alive through this spring, 10 days after April 15, he had to be responsible in any case. So he cut his sod about 1¼ inches thick.

The sod on this project was laid in the bottom of roadside ditches and waterways subject to erosion.

Seeding on Slopes

Embankment slopes, chiefly along the fill sections, were protected also. This was done by sowing about 50 pounds of seed per acre on 104 acres of exposed surface. About 30 pounds of this seed mixture consisted of a nurse crop of oats, with 20 pounds of other seed divided equally between crested wheat grass, brome, and slender wheat grass.

Ford used equipment to prepare the ground and do the seeding. A Ford rubber-tired tractor with a Ferguson cultivator first covered the ground and plowed it up to a depth of about 2½ inches. Cyclone seeders then scattered the seed over the ground. The seeding was followed by a pass with a Ferguson weeder, which pulverized the soil further and dragged out any weeds or debris which might be present. This left the soil smooth and well dressed.

There is no great amount of rain in western North Dakota, and plans did not call for any mulching.

Unusual Water Wagon

Ford has also developed his own type of water sprinkling truck, which he must use to keep the planted areas alive. He has five of these machines. The one at Medora was a Dodge, on which is mounted a 1,000-gallon steel tank. A Barnes 2-inch pressure pump permits the truck to pick up a load at any creek or river in about 8 minutes, and to discharge the water in 12 minutes.

C. & E. M. Photo

A Ferguson cultivator on a Ford tractor works alongside U.S. 10 in North Dakota, preparing a long slope for seeding.

The long flexible hose on the machine, with a steel nozzle, will throw water 120 feet. The truck can thus park along the road and shoot the water out to any sod or grass in outlying areas. A small 750-pound power roller, shop-made, was used to press the sod down.

Ford tries to operate in such a way as to keep all sod set up which his machines cut, even if he has to hire a large crew locally. He and Mrs. Ford direct his work.

Roadside planting extended out to this part of North Dakota emphasizes the importance of covering by natural processes the scars which men and equipment leave in the earth when they build a new highway.

Brad Foote Buys Gear Co.

American Gear & Mfg. Co., Chicago 50, Ill., is now a division of Brad Foote Gear Works, Inc., Cicero, Ill. The two companies will consolidate their operations but no change in personnel or policy is planned. American Gear will offer an increased number of services because of the facilities made available to it by the consolidating move.

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PAVING BREAKER TOOLS

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Write for descriptive circular

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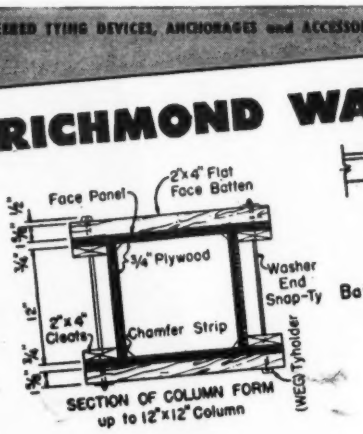
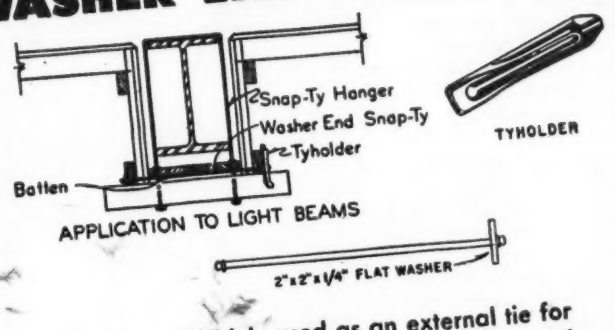
12 LIME STREET ROCKLAND, MAINE

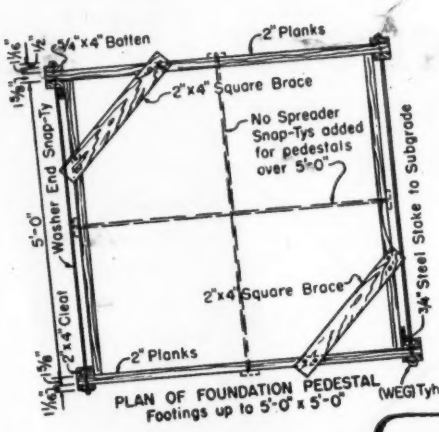
ENGINEERED TYING DEVICES, ANCHORAGES and ACCESSORIES for CONCRETE CONSTRUCTION

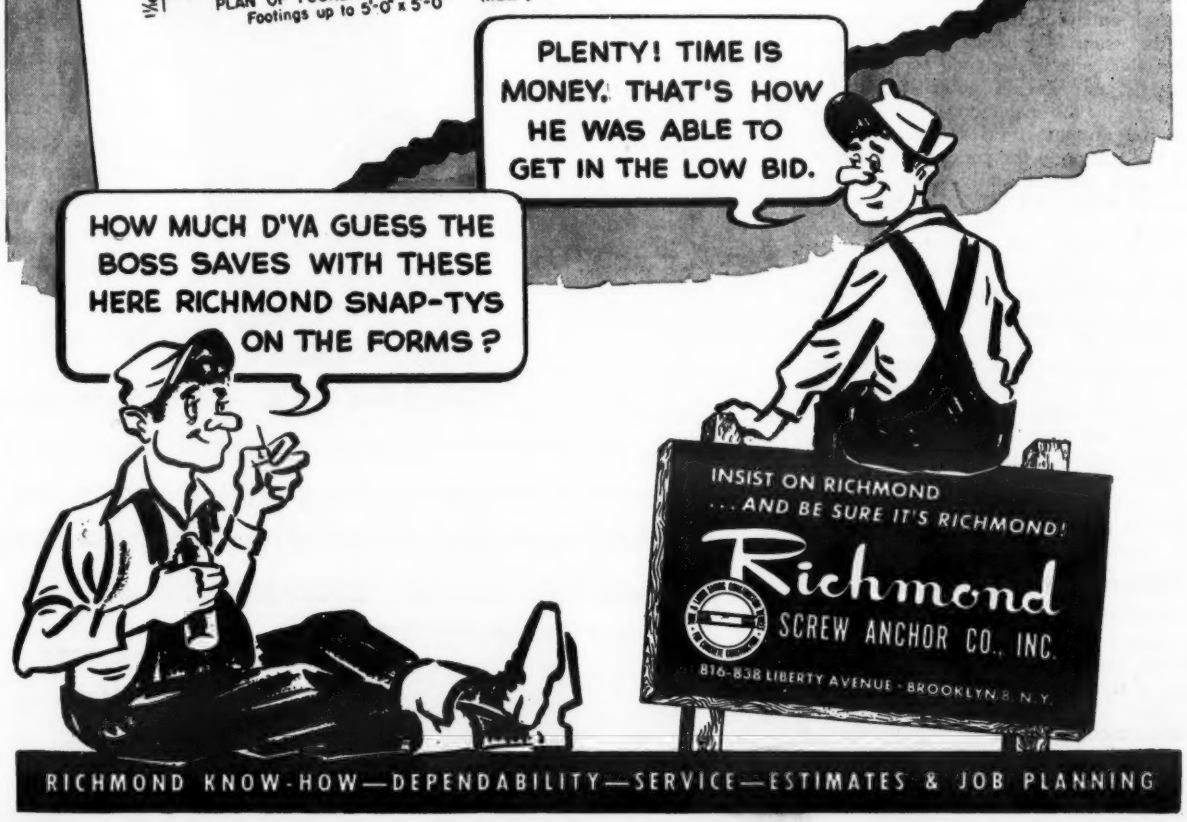
RICHMOND WASHER END SNAP-TY





Widely used as an external tie for light column or low heavy pedestal forms, this Richmond Snap-Ty has a ¼"x2"x2" flat washer against the head washer at one end. It speeds both form erection, stripping, and effects a substantial additional saving in lumber and nails. Richmond's Technical Department will prepare blueprints for you without charge showing how you can use this cost-cutting Snap-Ty on your jobs.




PLENTY! TIME IS MONEY. THAT'S HOW HE WAS ABLE TO GET IN THE LOW BID.
HOW MUCH D'YA GUESS THE BOSS SAVES WITH THESE HERE RICHMOND SNAP-TYS ON THE FORMS?
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RICHMOND KNOW-HOW—DEPENDABILITY—SERVICE—ESTIMATES & JOB PLANNING

It rotates, it cleans the hole—Syntron's new self-rotating gasoline-powered hammer rock drill.

Self-Rotating Drill

A new self-rotating hole-cleaning gasoline hammer rock drill has recently been announced by Syntron Co., 227 Lexington Ave., Homer City, Pa. It utilizes practically the same principle of operation as the paving breaker—a single-cylinder engine driving two pistons, one actuating the flywheel magneto and cooling fan, and the other striking directly on the shank of the drill steel. The rotation of the hollow drill steel and bit is accomplished by the orthodox method of using a spirally splined piston and ratchet. Exhaust gas is forced through the hollow drill steel to blow the cuttings out of the hole, down to a depth of approximately 24 inches, according to the company.

For drilling holes 8 or 10 feet deep, a small lightweight auxiliary gas-engine-driven blower is connected by hose to the hammer to boost the pressure through the hollow drill steel. The hammer uses standard 1 x 4¼-inch-shank hollow drill steels and detachable carbide-tipped drill bits 1½ to 2 inches in diameter.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 35.

Cast-Iron Electrode

A new cast-iron electrode, designated the All-State No. 8 machinable cast-iron electrode, has been announced by All-State Welding Alloys Co., Inc., 273 Ferris Ave., White Plains, N. Y. It has a core that is more than 99 per cent nickel, and it is 15 inches long instead of the usual 14 to decrease stub losses. The electrode is designed for ac or dc straight or reverse polarity and for amperages ranging from 40 to 180 depending on diameter. It is recommended by the company for general welding of cast iron and especially wherever free machinability and color match are required.

Welds made with this electrode are ductile and said to be 100 per cent machinable even at the bond. Tensile strength is 30,000 to 50,000 psi. All-State says that the rod gives a smooth deposit, with a finish job practically free of spatter; flux residue is easily removed; it welds cold; and it can be used for all types of joints and all positions.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 17.

Coleman Motors Executives

Harleigh R. Holmes, Sr., has been promoted from President of Coleman Motors Corp., Littleton, Colo., to Chairman of the Board of Directors. Howard H. Agee is now President. E. L. Martin was elected Vice President and W. C. Ramsey Secretary-Treasurer.

Mr. Holmes, Sr., held the original patents on the Coleman front-wheel drive and has been President or Manager of the company since its organization in 1922.

Renewable-Tip Hammers For Pulverizing Equipment

A broadside describing Quad-Edge renewable-tip hammers and grate sections for rock breakers has recently been issued by the Kensington Steel Co., 505 Kensington Ave., Chicago 28, Ill. It points out that the Quad-Edge replacement tips have four useful service edges. The shanks can be reused and hammers are maintained at full efficiency by replacement of tips at suitable intervals. The hammers are made of Oro Kencrome and Oroloy, specially alloyed manganese steels designed to resist shock and abrasion. Both the hammers and the grate sections are fully described and illustrated in this bulletin.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 41.

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- VISIBLE MIXING
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the heat-resistant anti-stripping additive

for asphalt cements, cut-back asphalts, road oils, road tars

DARAKOTE differs from ordinary anti-stripping additives in that it **retains its strength at elevated temperatures.**

DARAKOTE is heat-resistant! Unlike other additives,

DARAKOTE withstands prolonged heating without significant chemical change, without consequent loss in strength.

DARAKOTE treated asphalt maintains its effectiveness . . . eliminates the need for "sweetening-up" with more additive.

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DARAKOTE makes it possible for asphalt to adhere better to wet, moist, or dry aggregates . . . during and after construction . . . despite the most adverse conditions of moisture and low temperature.

DARAKOTE is the trade name for the heat-resistant anti-stripping additive developed and manufactured by DEWEY and ALMY Chemical Company. A product of five years' research in the laboratory and in the field, DARAKOTE has been tested and proved by top-ranking asphalt paving technologists.

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Pumping Plant Built At Grand Coulee Dam

Monstrous Plant Holds Pumps To Raise Columbia River Water 283 Feet to Canal

✦ CONSTRUCTION of the Grand Coulee Pumping Plant, the second key structure in the vast Columbia Basin Project, has begun. With the completion of its complicated concrete work, and the installation of the world's most powerful pumps yet built, one of the most ambitious river control projects envisioned by man will be a step closer to reality.

Morrison-Knudsen Co., Inc., of Boise, Idaho, and Peter Kiewit Sons' Co. of Omaha, Nebr., have the $13,348,000 contract with the U. S. Bureau of Reclamation. It is a joint venture. The big project includes not only the pumping plant, but also the headworks; second-stage concrete around the scroll cases in the pumping plant; construction of a shelter for a hydraulic model; excavation of 3,188 feet of canal 50 feet wide on the bottom and 25 feet deep, with 1½ to 1 slopes; and miscellaneous work in the East Powerhouse.

It is an ambitious building program on a project world-famous for its size and daring. Compressed into a space only 100 x 600 feet, approximately $7,000,000 worth of construction is being pushed to completion rapidly so irrigation water will reach the first arid acres by the spring of 1952.

Starts Distribution System

The main distribution system of the Columbia Basin Irrigation Project begins with the Grand Coulee Pumping Plant.

The pumping plant, dependent upon power generated at the Grand Coulee Dam, will carry on where the dam leaves off. It will raise Columbia River water out of its deep canyon to a prehistoric coulee, where the river once flowed before it changed its course and cut the deeper channel. The dam raised the river level 350 feet. The pumping plant will boost river water about 283 feet higher. Then, at an elevation 633 feet above the river, water will flow by gravity down the Grand Coulee toward the lands to be irrigated.

The base for the pumping plant, including a 600-foot wing dam, trashracks, and intake structures, was constructed during the building of Grand Coulee Dam. The foundation rests on a shelf excavated in the west wall of the canyon, adjoining the upstream face of the dam. The wing dam is similar in design to the parent structure.

Man's most powerful pumping units will be installed. Each unit will comprise a vertical-shaft centrifugal pump, direct-connected to a 65,000-hp synchronous motor. Each motor-pump installation will be about 50 feet high. Plans call for 12 units, 2 of which will be held in reserve. The pump units will be operated in pairs, each pair to be supplied with power by one of the 150,000-hp generating units in the adjacent West Powerhouse, just below the Grand Coulee Dam.

C. & E. M. Photo

This picture shows the point where the discharge pipes from Grand Coulee Pumping Plant break over the top of the hill.

Each pump will discharge through a steel pipe 12 feet in diameter and about 680 feet long. Twelve tunnels, from 487 to 530 feet in length, will carry the pipes up through the canyon wall of granite, behind the pumping plant. Upon emerg-

(Continued on next page)

Equipment of Hendrickson Brothers, Valley Stream, N. Y., moving earth to make way for a housing project at Great Neck, L. I. Among other recent big jobs of Hendrickson Brothers in that area is a $6,500,000 sewage disposal plant for Nassau County, N. Y.

"We have a 26-year record of dependable equipment performance with

Gulf Quality Lubricants and Fuels"

says President A. J. Hendrickson of Hendrickson Brothers

"We have used Gulf products for over a quarter of a century because of outstanding quality and Gulf's ability to get products to us when and where needed," says Mr. Hendrickson.

The use of quality petroleum products is one of the surest guarantees of smooth, dependable equipment performance and low maintenance costs—which add up to speedier jobs and greater profits! That is why so many leading contractors engaged in all types of construction work specify Gulf quality lubricants and motor fuels.

Gulf products are available to you through 1200 warehouses located in 30 states from Maine to New Mexico. Write, wire, or phone your nearest Gulf office today.

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Take em Anywhere!

Use Electric Tools on Every Job

Carry, wheel, or truck 'em to any spot and plug in for all the electric power you need. Lightweight, Onan air-cooled electric plants supply power for electric drills, saws, planers, spades, tampers, lights . . . any electrical equipment. Lightweight A.C. models: 400 to 3,000 watts. D.C.: 750 to 5,000 watts. (Heavy-duty gasoline or Diesel plants to 75,000 watts.)

Write for Folder

D. W. ONAN & SONS INC.

4858 Royalston Ave., Minneapolis 5, Minnesota

Pumping Plant Built At Grand Coulee Dam

(*Continued from preceding page*)

ing from the tunnels, the pipes will continue on concrete piers for an average of about 200 feet, and discharge into the headworks for the Feeder Canal, also under construction by Morrison-Knudsen Co., Inc., and Peter Kiewit Sons Co.

Excavation Already Done

The whopping-big chunk of rock excavation for the pumping plant and tunnels for the discharge pipes had already been done at the time the dam was built, and with the exception of minor dressing, little remained. The main problems were concerned with building construction. Some 27,000 cubic yards of concrete in the 600 x 100 x 185-foot-high pumping plant have been placed thus far under many conditions, all of them tough.

Steel reinforcement so thick it had to be pried apart with hydraulic jacks to enter an 8-inch concrete trunk; 64.5-foot shoring supporting a slab, beam, and girder system with a span of 54 feet and a dead load of more than 1,000 tons per unit; continuous stainless-steel waterstops between blocks; a 103-day safety record which saw no one hurt despite the dangerous nature of the work; the use of prefabricated stair sections to get men in and out of the deep hole: these are a few of the highlights of work which now is under way.

Concrete Forming

Prefabricated wooden forms are being used to shape the concrete pours. These forms are being constructed mostly in a carpenter yard near the south end of the pumping plant, near the highway which skirts around the dam. Form work is carried on in this yard at peak production five days a week, and anything which cannot be turned out here is built in a secondary or overflow yard across the river near the company camp, and trucked out to the job.

A 110-foot stiffleg derrick at the south end of the building adjoins the carpenter yard. It covers the framing activity, handles steel reinforcement, and does some of the concrete placing in the erection bay. Two American R-20 revolver cranes on 50-foot gantry frames, each machine with a 105-foot boom including a 10-foot jib, handle forms and other material also. These machines have a capacity of 5 tons on the tip of their boom, and 20 tons on the main block with the boom at its normal angle.

In general, four sets of concrete forms are being used three times each to form the 12 pumping-plant blocks. Lifts range in height from 6 to 9½ feet. The forms are faced with plywood in all cases where the concrete is exposed, and then in addition some of the concrete is sack-rubbed where an architectural finish is desired. Since the concrete work is very heavy, the forms necessarily are heavy to match.

Plywood seams or joints have to match, and no interchange of plywood grain is permitted.

The forms are tied together, after the steel is set, by heavy steel form ties with 3-inch-long metal cones. Very heavy shoring is required under the concrete deck at elevation 1,290. In this case about 1,000 tons of concrete has to be supported over a span of 54 feet by shoring 64.5 feet long. Heavy 21-inch steel I-beams are being used for this, with a secondary floor about 5 feet below the main deck to facilitate forming, stripping, and so on.

Concrete Central-Mixed

Concrete is being centrally mixed at a batch plant approximately ¾ mile south of the plant. The mixing and batching facilities include a Noble full-automatic batch plant, a Robinson cement conveyor, two 2-yard gate-dump concrete mixers, and hauling equipment.

Aggregate and sand for the concrete mix is being produced nearby by a subcontractor, Central Sand & Gravel Co., while bulk cement is being furnished by the Government. The various ingredients, including water and air-entraining agent, are proportioned automatically in the Noble plant, sent to the mixers, and the fresh concrete is then hauled to the point of placement.

Six 4-yard Dumpcretes on Mack trucks, with three 2-yard Dumpcretes on Chevrolets, are doing all the hauling. The concrete reaches the job in excellent condition, without any apparent segregation. It is transferred to the pour by 2 and 4-yard Gar-Bro concrete buckets, swung from the traveling American R-20 revolver cranes. As a rule all concrete placing is being done on the swing and graveyard shifts, leaving the daylight hours free for form erection, stripping, and so on. The concrete placing is so complex that a regular chessboard of moves is necessary, and a rigid schedule is maintained. There are over 35 vibrators on the job —Chicago Pneumatic air machines and

(*Concluded on next page*)

OIL ROAD SMOOTHER

Cuts Costs 2/3!

Attach it to your grader for cutting and pulverizing high shoulders and bumps, filling in depressions, and compacting the material into a new wearing surface.

Write for circular. A few choice territories still open for good live distributors. Also manufacturers of "ELECT-DRAULIC" power unit for operating truck-mounted snow plows, and V and straight blade plows.

COATES MANUFACTURING COMPANY
CORYDON IOWA

Another technical editor confirms reasons why engineers prefer Gurley Aluminum Transits

Combining durability and lightness with precision for surveying transits

by David W. Veit
Editor, Die Castings Magazine

MANY surveying instruments built by W. & L. E. Gurley, Troy, N. Y., are accurate within one second of arc. If projected, this represents a maximum error of ⅜ inch in a mile.

However, precision is not the only requirement of these instruments. At least three other major factors influence the design and choice of materials for this type of equipment.

In the first place, a surveyor's transit must not only *be* accurate, but must maintain its accuracy over an indefinite period of years despite all sorts of weather and climatic conditions —heat, sub-zero temperatures, dampness, dust or salt-saturated atmospheres.

Second, it must withstand rough usage. This is outdoor equipment subjected to impact and abrasion.

The third requirement — no less important than the other two to the surveyor who carries the transit around all day long —is lightness.

The combination of accuracy and ruggedness could be secured by constructing the transit of heavy-sectioned castings, forgings or fabrications in steel or bronze, extensively machined and elaborately assembled. This choice of materials would, however, fail to include one significant feature—lightness.

The way in which Gurley has been able to combine all three desirable features has been by turning to aluminum for a major group of components. And since aluminum has been picked to fulfill the physical and mechanical needs of these surveyor's transits, it is not surprising that several of the most important parts are being produced most economically by die casting.

Die cast aluminum parts include the truss standard, telescope housing and leveling spider, as well as rod targets and tripod clamps. Aluminum alloys used for these transits have greater stability and rigidity than bronze. In addition, the die casting process permits unitary construction of the mounting frame, contributing further to rigidity.

From the point of view of weight reduction, aluminum die castings have permitted a 25 percent decrease in total weight, as compared with sand cast bronze. Die cast aluminum offers additional weight saving advantage, even as compared with sand cast aluminum, due to the thin, uniform wall section which is practical by die casting.

This pioneering instrument builder has used aluminum die castings wherever possible; this is one of the few production short cuts possible in a manufacturing operation characterized by extensive machining, finishing and assembling operations within close tolerances.

This company has maintained its leadership in the field of engineering and other types of instruments by a willingness to investigate and introduce into their production line the new materials and methods made available by technological advance. The excellent reputation of this company's instruments during the past century is sufficient testimony for the reliability of the materials which they use.

Reprints of the full-length article from which this is reproduced are available on request.

Field-proven over 74 years—Gurley Aluminum Transits are used from the Arctic to the Tropics. In the words of a combat engineer during World War II, "These instruments were subjected to the worst degree of heat, cold, mud, and dust a transit *should not* have. After being dropped, and everything else imaginable, they still did work up to par." The first Gurley Aluminum Transit was retired after 50 years of service to join the exhibit of Gurley "firsts." Gurley Instruments are described in Bulletin 50. Would you like a copy?

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C. & E. M. Photos

Looking down on the Grand Coulee Pumping Plant, above, we see a stiffleg derrick in the foreground and the deep excavation behind. Concrete is produced at the Noble batch plant shown at right. Morrison-Knudsen Co. and Peter Kiewit Sons Co. are the joint contractors.

Mall electrics—just to handle the concrete consolidation.

Placement of concrete around the big 12-foot-diameter steel discharge pipes is also interesting. The concrete is being handled here by a 200 Double Rex Pumpcrete machine. The first pour seals in the horizontal lower section of pipe, filling the entire space between the pipe and the granite rock walls of the tunnel. Then the next pour, made from the top, completes the concrete backfill to the upper portal.

Despite many weeks of bad weather last spring, plus a labor strike which virtually closed the job for several weeks, the work is proceeding nicely. At the time the project was visited, negotiations were under way between the contractors and the Government to speed up the work beyond the schedule as originally set, in order to get the water moving as soon as possible. While some 1,080 days from November 18, 1948, are allowed for completion, everyone hopes now to beat that schedule.

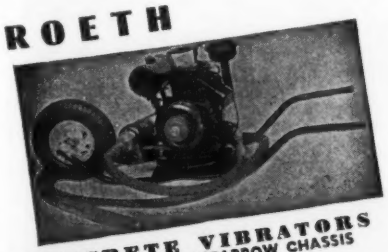
Contractor operations are under the general supervision of Project Manager A. O. Strandberg, who is assisted by R. H. Madsen, Assistant Project Manager, and M. J. Howard, General Superintendent. C. H. Jackson is Resident Engineer for the Bureau of Reclamation.

Belt-Conveyor Carriers

Bulletin 1148 recently issued by Stephens-Adamson Mfg. Co., Aurora, Ill., describes the Sealmaster ball-bearing belt-conveyor carriers. Special features are singled out: self-aligning, heavy-duty ball bearings, sealed to keep the dirt out and lubricant in; one-shot lubrication from either side of the carrier; self-training, with the rollers designed to keep the conveyor belt centered; one-piece all-steel frame; and interchangeable parts. The catalog points out that the carriers are built in two styles and in a wide range of sizes for every conveyor application. Each design feature is completely detailed and full specifications are given for every available model.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 100.

ROETH



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REVER-SHARP ALREADY IN USE—AND SERVICE-PROVED

Acceptance of the Rever-SharP is enthusiastic—*one user reports 6 times the service of former teeth.* Get the complete facts on this new, better dipper tooth. Write today for complete information.

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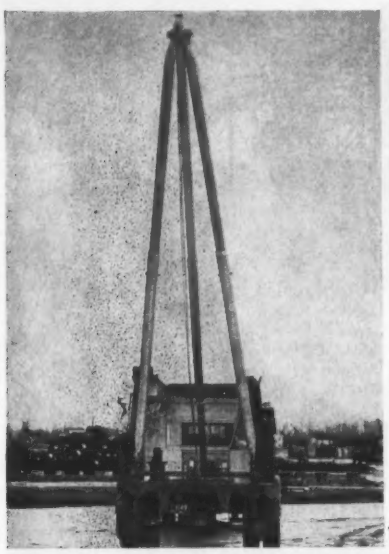


This telescoping all-aluminum derrick handles loads up to 5,000 pounds and poles 50 feet long. When vehicle-mounted, it has a lift of 20 feet.

Telescoping Derrick

An all-aluminum telescoping derrick has recently been fabricated by The American Coach & Body Co., 9503 Woodland Ave., Cleveland 4, Ohio. Designed with a safety factor of 3, the derrick is recommended by the company for loads up to 5,000 pounds. It is suitable for use on any utility-type line truck or platform truck, incorporating the standard middle-type fitting. Overall length of the side legs is approximately 17 feet; thus when the derrick is mounted on a vehicle, it has a lift of approximately 20 feet. The roller-type head is designed to eliminate all possibility of winch-line chafe regardless of the angle of pull.

These derricks are made of type 61ST6 tubing manufactured by the Aluminum Co. of America. They represent a weight saving of about 50 per cent over conventional pole derricks, according to Alcoa. The light weight also makes it easy to assemble and disassemble the unit.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 138.

Soil-Test Equipment

Of interest to both field and laboratory men is a complete line of soil-testing apparatus available from Soil Testing Services, Inc., 525 N. Noble St., Chicago 22, Ill. It includes unconfined compression devices, a motorized soil lathe, triaxial shear apparatus, consolidometers, compaction molds, sample ejectors, consolidation specimen trimmers, liquid limit devices, permeameters, and Tyler sieves.

Both a hydraulic type and a spring-type portable unconfined compression device are available for field work. In the former the load is applied to the specimen through a hydraulic cylinder actuated by compressed air or other gas. All consistencies of soils, including hardpans, can be tested in this device, according to the company. The load applied to the specimen is indicated on the double proving ring dial. Complete stress-strain data may be obtained by reading this dial and the specimen deflection dial at intervals during the test. The load may be instantaneously released at any point in the test; this feature makes it possible to stop the test at the point of failure to keep the specimen intact for measurements, photographs, drying, etc.

With the spring-type device the strain on the soil specimen and the elongation of a calibrated spring are automatically traced on a recording chart during the test. This chart becomes a permanent test record from which complete stress-strain relationships for the soil specimen can easily be obtained.

In addition to marketing this soil-testing equipment, Soil Testing Services, Inc., is prepared to perform foundation boring and testing and to submit soil analyses and reports.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 152.

Air-Entraining Mix

For frost-resistant concrete or for greater workability of lean or harsh mixes, the Sika Chemical Corp., 35 Gregory Ave., Passaic, N. J., makes Sika AER, a non-toxic non-flammable concentrated solution of neutralized processed wood resin for air entrainment. Available in 1, 5, 30, and 55-gallon containers, Sika AER is designed to produce air-entrained concrete with good strength and workability.

With no change in setting time, this air-entraining agent is said to reduce segregation, bleeding, honeycomb, and water pockets; to speed placing; to increase cohesion, strength, and resistance to frost damage and to scaling when salt is used; and to improve appearance and uniformity. It may be used with other types of admixtures such as inert or cementitious powders and accelerating or retarding densifiers. The air content is in direct proportion to the quantity of Sika AER added in all cases, the manufacturer says.

An exclusive pump-type dispenser to add Sika AER to either ready-mixed or job-mixed concrete has been developed by Sika Chemical Corp. This dispenser consists of a pump that is set directly on the drums in which Sika AER is furnished. Small pipes are connected to the point of discharge desired and a timing device hooked up at a convenient location.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 21.

Supplies Cement in Oregon

The Portland, Oreg., distribution plant of the Permanente Cement Co., originally acquired as a transfer point for cement used in McNary Dam, will from now on supply cement to the Oregon commercial market. The company's move was influenced by a cement shortage in Oregon which forced some builders to import from the midwest. Cement will be sold in bulk or in sacks for the convenience of both large and small users.

Portable Pumping Unit

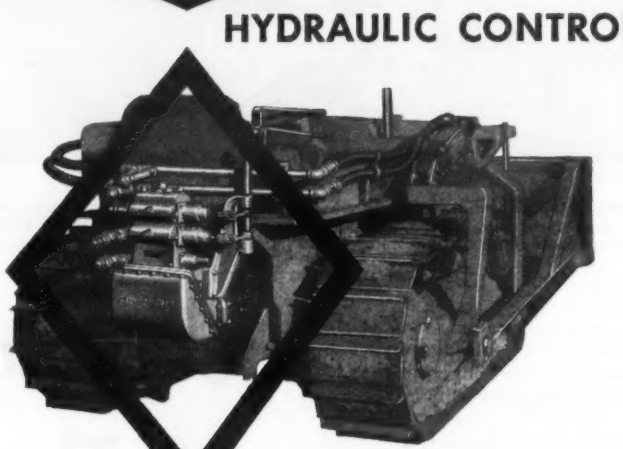
A bulletin describing the Hale Type NP self-priming, lightweight, portable pumping unit has recently been prepared by the Hale Fire Pump Co., Conshohocken, Pa. It describes and illustrates the pump in operation and includes full specifications on all component parts and features. The unit weighs 65 pounds and is designed for small-scale work. It is said to deliver 60 gpm under a 10-foot total head and 15 gpm under a 100-foot head.

This literature, Bulletin No. 282, may be obtained from the company, or by using the Request Card at page 16. Circle No. 92.

KAY-BRUNNER

One package

HYDRAULIC CONTROL UNIT



pump, valves and tank in ONE UNIT

This Hydraulic Control Unit can handle any number of ram-operated attachments simply by adding additional valves. The illustration above shows a typical installation for combination dozer and scraper operation. By adding valves, other attachments can be handled.

The pump, tank and valves are shown rear mounted as one unit. When necessary the control valve can be mounted separately any place on the tractor.

Control valves are provided with a float position, which allows free circulation of fluid to both sides of the ram piston, without hydraulic lock. This feature is adaptable primarily for dozer operation. Valves are so designed that ram lag is eliminated.

Cool operation of this Hydraulic Control Unit is assured because of a large reservoir, permitting ample surface contact of hydraulic fluid for dissipation of heat.

Adaptable to all models of all crawler tractors, this one package Hydraulic Control Unit affords a flexibility of application and ease of operation unequaled by any similar unit. Write for Bulletin 366-ED.

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Hot-Mix Upper Deck Modernizes Highway

Concrete Slab Is Reclaimed By Patching, Widening, and Redecking With Two Courses Of Asphaltic Concrete

✦ A 7.8-MILE section of U. S. 36, from Chillicothe, Mo., west, has been reclaimed from obsolescence by the expenditure of $176,000. Land Construction Co. of St. Joseph, Mo., and C. H. Atkinson Paving Co., have widened the 20-year-old, 18-foot concrete slab, and then covered the total paved surface with two courses of hot-mixed asphaltic concrete.

Wet weather dogged the work, and 19 rainy days in June delayed the start of operations until June 22. On October 1, however, the project was completed. The interruption to passing traffic was over. Some of the storms were so freakish that work would be shut down at one end of the project, while the other was dry and sunshiny. One flagman often wore a raincoat, while the man at the opposite end was in shirt sleeves.

Prior to the contract letting, the Missouri Highway Department's Bureau of Maintenance worked for several months to prepare the old concrete slab for its redecking. Asphalt underseal was placed under most of the pavement, to improve its supporting value and drive the water pockets out of the subgrade. Broken places were removed, the mushy subgrade was excavated to solid material, and a crushed-rock base went in below the concrete patches.

The slab had no curb, so it was not necessary to break any of this material.

Pavement Is Widened

Widening plans called for a trench 9 inches deep and 18 inches in width, with vertical sides. The excavation of a trench to these dimensions without special equipment has been somewhat of a problem on similar work, but on this job it was solved without trouble for about $150. R. U. Knox, the Master Mechanic for Land Construction Co., designed a special shop-made plow to cut the trench.

The plow was made up of 1-inch boiler plate steel. It consisted of a sharp, hard cutting blade, a vertical cutting edge to form the outside of the trench, and support arms to hold the mounting bolts. The plow was fastened to the left edge of a Caterpillar No. 12 grader moldboard. This threw the dirt over to the blade. By working the grader on the pavement and shoulder, the earth was excavated without too much trouble, although the machine sometimes had to make three or four passes to get it all. A shoe on the plow prevented the cutting edge from digging deeper than 9 inches.

The plow blade was so efficient that the operator finished 2 miles of widening trench each day he worked. Because of the wet weather, the trench was built only as fast as the widening materials could be laid, because nothing is so discouraging to a superintendent on this type of job as a trench full of water and the hot plant all steamed up to go.

A 3-inch-thick cushion of crushed rock, well graded from fine to coarse, was then installed. This rock was shipped in from Chillicothe Stone Co., supplier of the hot-mix aggregate, and trucked out to the trench. It was placed in an exact layer by an Apsco spreader box, which averaged a mile per 8-hour shift and sometimes got as much as 8,000 feet.

Specifications called for this rock to be rolled by a pneumatic machine capable of delivering 300 pounds of pressure per foot. The pneumatic wheels off an old spreader machine were salvaged and put on one end of the rear axle on an old 1934-model Ford truck. The

(*Concluded on next page*)

C. & E. M. Photo
An Etnyre distributor shoots prime coat onto the concrete pavement of U. S. 36 near Chillicothe, Mo., ahead of the hot-mix laydown machine.

MOBILITY MEANS BUSINESS

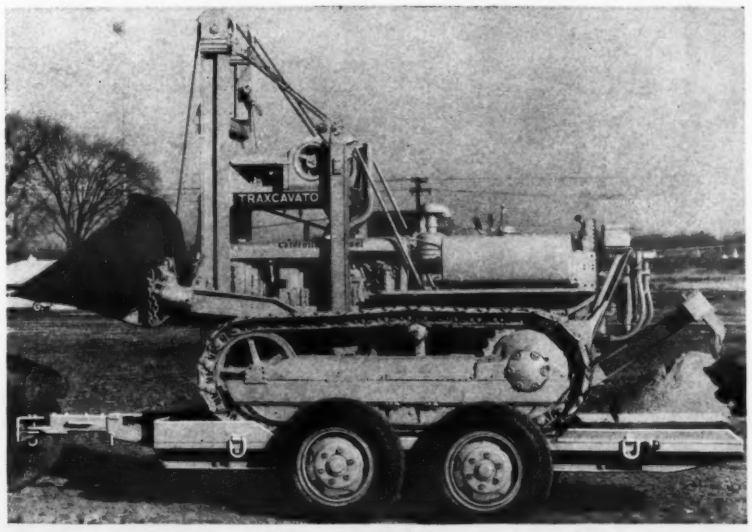
When there is real work to be done, profit-minded equipment users are turning to this money making package unit, consisting of a MARTIN Model 222 Trailer and T4 "Traxcavator."

Designed especially for this package combination, the MARTIN Model 222 Trailer adds mobility to the equipment on or off the highways, cutting down the time in moving from job to job, allowing the handling of a series of jobs and eliminating many hours of lost working time. It converts moving time into profit time and makes it possible to do that small job between those big jobs. The operator merely drives on and pulls away, drives off and goes to work.

Quickly and safely loaded or unloaded in a moment's time, the complete unit is easily towed by the average dump truck. The entire operation is a one-man job.

The photos below illustrate the simple manner of loading the T4 "Traxcavator" onto the MARTIN Model 222 Trailer. This rugged combination is being sold as a profit-making package by "Caterpillar" dealers everywhere.

Loading a T4 "Traxcavator" on a MARTIN Model 222 Trailer.



Loaded in a few moments, ready to go to the next job.

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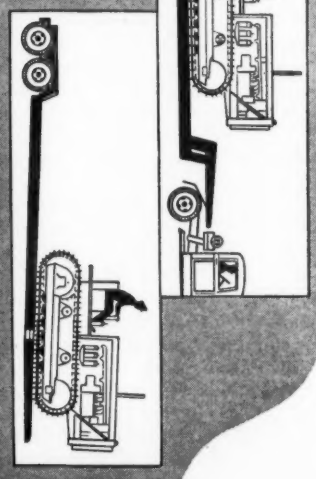

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Hot-Mix Upper Deck Modernizes Highway

(Continued from preceding page)

truck bed was then filled with aggregate to develop the proper weight. With the rolling wheel in place, it was 6 inches lower than the standard tire on the other side, which made it set level when the machine was in action. The home-made device worked very well, and satisfactory compaction was obtained.

Two 3-inch Type B courses of hot-mixed asphaltic concrete then went in. A second Apsco spreader box was used to lay this material. The hot-mix in trenches was compacted by two new Apsco trench rollers and a Buffalo-Springfield trench roller.

Preliminary operations also included an interesting feature: the improvement of curves by building superelevations with asphaltic concrete. W. C. Brower, General Superintendent, smiled wryly as he recalled the first one they built.

"We tried to end-dump the hot-mix out of trucks, and then build our super," he explained. "It didn't work out so well. There was so much blade work to do that the stuff got cold before the operator had her all shaped. Then we had a hell of a time."

But that one experience, according to Brower, was enough, and it didn't take long to change.

"We used an Apsco spreader to proportion the stuff just right on the supers, and then only three passes of the blade was enough to build the right elevations."

Some of the widening and superelevation work was especially well organized. The company had two large 8-ton rollers on the project—one a Buffalo-Springfield 3-wheeler and the other a Galion tandem. While one of these machines stayed behind to finish the superelevation section just put in, the other moved on ahead with the motor grader to the next site. The machines handled 500 tons of material in 8 hours one day, skipping around like that over several miles of highway.

Hot Plant in Town

The hot-mix asphaltic concrete was proportioned and mixed along the Burlington Railroad sidings in the town of Utica, Mo. A Barber-Greene Model 845 continuous-mix plant was set up there, and the one set-up was used to batch the material for the entire job. This plant batched 497 tons in 8 hours on the peak day, and since the work was far from finished then, officials expected to better that record.

Coarse rock aggregate for the mix came in from Chillicothe Stone Co. Fine sand originated in the Pioneer Stone Co. at St. Joseph, and coarse sand came from Cooley Sand & Gravel Co. at Sampsel, Mo. All of these materials were clammed out and stockpiled to pass through the plant.

Asphaltic cement was 70-85 penetration, and came in by rail from the Sugar Creek, Mo., refinery of Standard Oil Co. of Indiana. The two storage tanks at the plant, which were heated by steam coils, held 12,000 gallons of bitumen. In addition, there was a 7,000-gallon fuel tank for the storage of heavy boiler fuel.

The hot-mix was sent to the project by a fleet of rented trucks, which hauled about 6½ tons per load. These trucks had a dead haul of ¾ mile, which put them on the highway about 1 mile from the west end of the project. The basic mix consisted of 20 per cent sand, 4½ per cent asphaltic cement, and the remainder rock aggregates.

There was some difficulty in feeding the fine sand through the plant, but it was solved by installing vibrating feeders on the fine bins. The 4-bin pull was made without excessive difficulty after these feeders were installed.

A Barber-Greene finisher laid the hot-mix down on the highway in two 10-foot strips. Two courses were laid to obtain the full 2¾-inch paving depth.

The pavement was laid without difficulty once the widening was in. The old surface was primed just ahead of the laydown machine by a 50-50 cut-back preparation of asphaltic cement and naphtha.

The project was designed and supervised under the general direction of Carl W. Brown, Chief Engineer of the Missouri Highway Department, with J. J. Corbett as Engineer of Construction, B. F. Leslie as Division Engineer, J. D. Barber as Division Construction Engineer, and R. C. Kealey as Project Engineer.

To Manage Pump Company

Fred E. Lewin, Vice President, has been promoted to the position of Executive Vice President and General Manager of the Ralph B. Carter Co., Hackensack, N. J., manufacturer of Humdinger pumps and sanitary engineering equipment.

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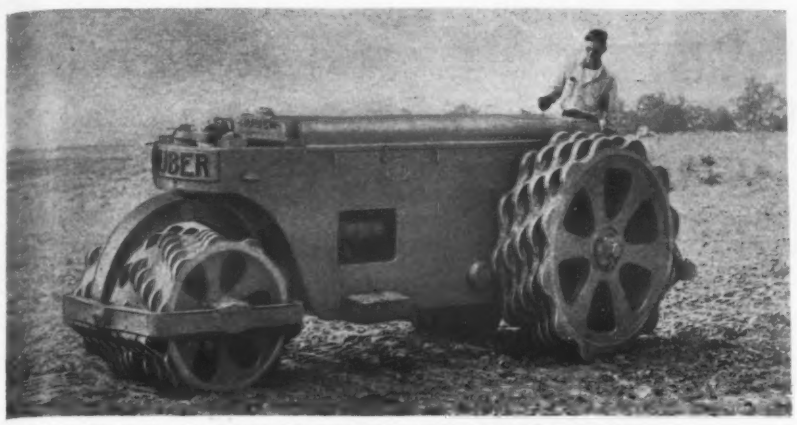
CHEVROLET



Notice the scalloped ribs on front and rear rolls of Huber's new compaction roller. The unit gives a per-linear-inch compaction of 5,387 pounds.

Compaction Roller With Scalloped Ribs

Recognizing the importance of compaction in highway fills, earth dams, etc., and the problems of meeting compaction specifications on contract jobs, engineers of the Huber Mfg. Co., 202 N. Greenwood St., Marion, Ohio, have designed a new compaction roller for a wide range of applications.

According to field tests, the new one-man-operated self-propelled machine gives a per-linear-inch compaction of 5,387 pounds. It is said to compact 4,100 square feet an hour at an average speed of approximately 2 mph. With a set of standard rolls, the Huber compaction roller can be converted to a conventional 12-ton 3-wheel roller.

The rear rolls have a series of five scalloped ribs at the outer circumference. Each rib consists of twelve 4-inch-high scallops, and the ribs are staggered from one row to another in such a way that there is a high point every 3¾ inches. The ribs are 2 inches wide and are spaced 2½ inches apart. The slope of the scallops on one roll is opposite to the scallop slope on the other roll—this is true of both of the two rear rolls and the two sections of the front roll.

The front-roll scallops are similar to those on the rear except that they are not as high. This arrangement provides better tractive effort, eliminates continuous grooves in the soil, and combined with the undulations of the bends, gives a kneading action, says the company. An independent roll-cleaning scraper for each groove is designed to free the grooves of dirt so that the scallops will give a uniform depth of pattern in the soil at all times. Other features of the new Huber include: a Hercules DRXC 6-cylinder diesel engine; 118-hp braking power at 1,600 rpm; force-feed lubrication; an oil-bath type of air cleaner; and an automotive double-clutch transmission with speeds ranging from 1.9 to 5 mph in either direction. The rear rolls have a 71-inch diameter and 20-inch width; front roll, a 44-inch diameter and 43-inch width. The unit has an 18-foot 3-inch overall length and a 6-foot 3-inch rolling width. The standard net total metal weight is 30,000 pounds.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 96.

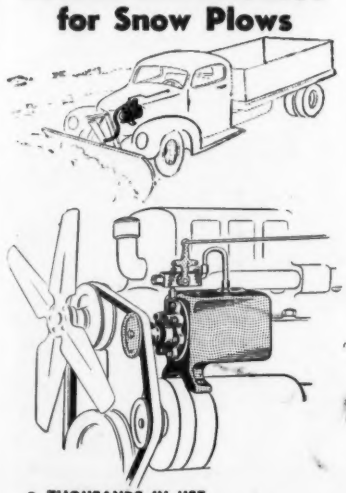
New Tool Does Both Planing and Sawing

A 4-inch planer that is convertible to a 6-inch portable saw has recently been designed by Cummins Portable Tools, Division of Cummins Business Machines Corp., 4740 Ravenswood Ave., Chicago 40, Ill. It is designed to do an accurate job of surface planing, with or across the grain, leaving a smooth chatter-free finish. Adjustment for depth of cut of the saw to 3/16 inch in wood is said to be accurate and easy. Three removable cutting knives are available. The bevel attachment has a safety guard which protects the operator from the cutter head. The chain belt and sprocket is smooth and positive in operation, according to the manufacturer.

Cummins' new 4-inch planer is convertible to a 6-inch portable saw.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 9.

POWER HYDRAULICS
for Snow Plows



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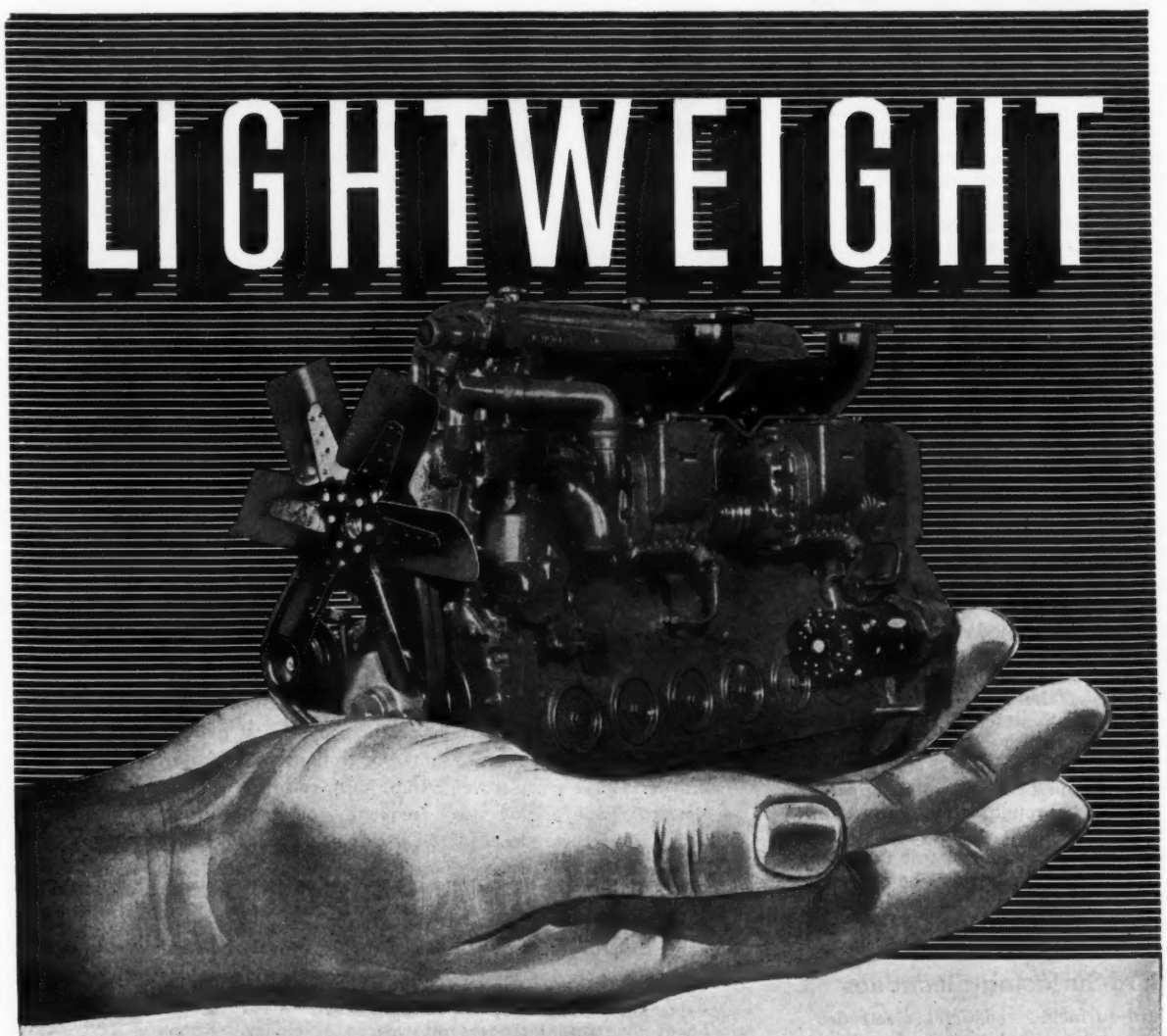
- FIT ALL TRUCKS.
- FAN BELT OR ELECTRICALLY DRIVEN MODELS.

• Write Hydraulic Division

MONARCH ROAD MACH. CO.
323 North Front Ave., Grand Rapids 4, Michigan



P&H DIESEL ENGINES
(2 CYCLE)

Now, for the first time, a line of diesel engines in which *all* major castings are of lightweight alloys. This is what you have waited for . . . *less weight per horsepower,* rugged design for the toughest jobs . . . proved performance. And longer life, too! Write for literature. Diesel Division, Harnischfeger Corp., Port Washington, Wis.

P&H DIESEL DIVISION
HARNISCHFEGER CORPORATION
PORT WASHINGTON P&H WISCONSIN, U. S. A.

The Gumouter tool permits a 50-50 cleaning solution of Gumout and gasoline to be gravity-fed through carburetors without dismantling.

Cleaning Carburetors Without Dismantling

A new tool for cleaning carburetors without dismantling has been announced by the Pennsylvana Refining Co., 2686 Lisbon Road, Cleveland 4, Ohio. The company states that its new tool, the Gumouter, for use with its product Gumout, permits thorough, easy cleaning of all internal parts of the carburetor in a matter of minutes without taking the carburetor apart or off the engine. Cleaning of the functional surfaces, venturi, jets, and needle valve is said to be as effective and complete as when done by removing, dismantling, and manual immersion.

To use the Gumouter, it is necessary only to detach the fuel line at the fuel filter or carburetor fuel intake. The fuel line is then capped or plugged with a five-way combination fitting which serves the majority of requirements. Combination male-female adaptor fittings are supplied with the Gumouter to extend its application to nearly all carburetors. The proper fitting is selected and attached to the fuel filter or carburetor fuel intake. The hose is then attached by means of a thumb-knurled swivel fitting. On the other end of the hose is a vented screw cap which is tightened onto the Gumout pint can. The can is then suspended from the underside of the hood by either the clamp or hook attached to it with a short chain.

The Gumouter permits a 50-50 solution of Gumout and gasoline to be gravity-fed through the carburetor while the engine is running at all speeds, from slow idle to full throttle.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 70.

Hard-Surfacing Electrodes

Hard-surfacing rods and electrodes for gas and arc welding are described and illustrated in a new catalog recently issued by the Rankin Mfg. Co., 3072 W. Pico Blvd., Los Angeles 6, Calif. Quality, type, and Rockwell hardness are given for each product. The folder lists nearly 200 recommended applications cataloged by industries, with the specific type of welding material that is to be employed.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 61.

Homelite Districts in Southeast

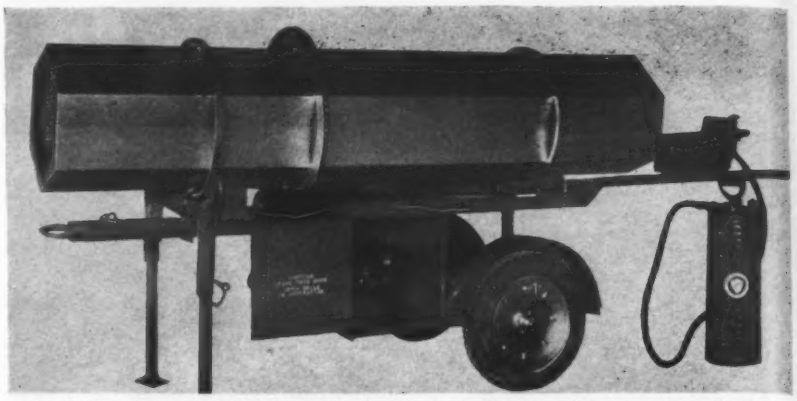
Homelite Corp., Port Chester, N. Y., has created four new territories in the southeast to handle sales and service of its gasoline-engine-driven pumps, generators, blowers, and chain saws.

Bill Bedford has been named Manager of the Memphis district covering most of Tennessee and Mississippi, the northeast third of Arkansas, and ten northern counties in Alabama. Ty Lubby is Manager of the Charlotte headquarters serving North and South Carolina and 24 counties in eastern Tennessee.

Jim Anderton heads the New Orleans territory, including Louisiana, southern Arkansas, 24 counties in southern Mississippi, the southwest corner of Alabama, and the two western counties in Florida. Norman Supove manages the Jacksonville territory: Georgia, Florida, and central Alabama.

Aggregate Heater

A new mobile aggregate heater, Model NBG-3, has recently been developed by The Tarrant Mfg. Co., Saratoga Springs, N. Y. The hexagonal heating drum is fitted with angular tumbling irons and revolves on four Oilite-bushed rollers. The all-welded frame is trailer-mounted on two pneumatic-tired roller-bearing wheels, easily towed by a telescoping towbar. Tires are protected by heavy-gage heat-resisting fenders. Legs are retractable. An air-cooled throttle-governed engine housed in a metal compartment revolves the heating drum by means of a steel-chain drive. The fuel-tank carrying rings are welded to the frame.

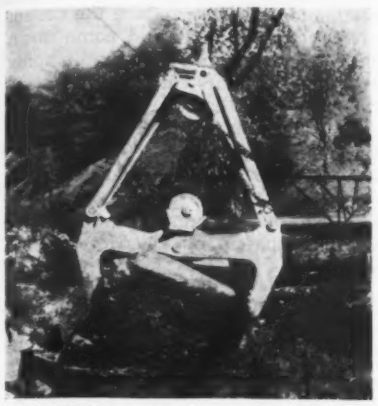


The Tarco Model NBG-3 aggregate heater is trailer-mounted on pneumatic-tired roller-bearing wheels. Legs are retractable.

Wet stone, sand, or gravel is shoveled or dumped into the 34-inch-high end of the slowly revolving heating drum. Material is mixed and progressed by a series of angular tumbling irons through heat supplied by a large swivel-mounted kerosene-burning torch.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 155.

KOEHRING
HEAVY DUTY
KOEHRING 205 HEAVY DUTY
1/2 YARD
KOEHRING
INDEPENDENT TRACTION increases production
With this Koehring heavy-duty 205 shovel, you get 2-speed, independent traction that is free of all other operations. Separate lever controls each crawler . . . lets you travel, swing, hoist, raise or lower boom all at the same time. Whenever you move frequently, or change boom angles to change reach, this quick maneuverability cuts non-productive time as much as 50%.
DUAL-PURPOSE BOOM handles both shovel and pull shovel
Rugged, heavy-duty boom handles either shovel or pull shovel. No need to change booms for either unit. This combination reduces initial investment . . . costs 25% less than conventional units requiring two separate booms. Saves time and increases all-purpose efficiency. Koehring 205 excavator can also be quickly converted to dragline, clamshell, lift crane or pile driver.
ACCESSIBLE MACHINERY cuts non-productive time
Here is another feature you'll like on the Koehring 205. Every part that requires periodic servicing or adjustment is readily accessible. You have less time out for adjustments. Simple, orderly and compact design of shovel boom, boom-hoist mechanism, traction gear case and main operating machinery provides greater operating ease . . . quick adjustments . . . cuts non-productive time to a minimum. You keep production at peak efficiency.
RESULT — these three big advantages can mean more production, lower costs on your shovel work. Remember, too, this 205 is available on crawlers or rubber tires to suit your job conditions. For complete information on the ½-yard 205 . . . ¾-yard 304, 1½-yard 605, or 2½-yard 1005 . . . see your local Koehring distributor soon, or write for literature.
CK810-REV.
Match your shovel production with Koehring shuttling DUMPTORS
KOEHRING COMPANY
SUBSIDIARIES: PARSONS KWIK-MIX • JOHNSON



The Wellman stone grab has a 5-ton capacity, and can be used with most ¾-yard crawler cranes.

Five-Ton Stone Grab

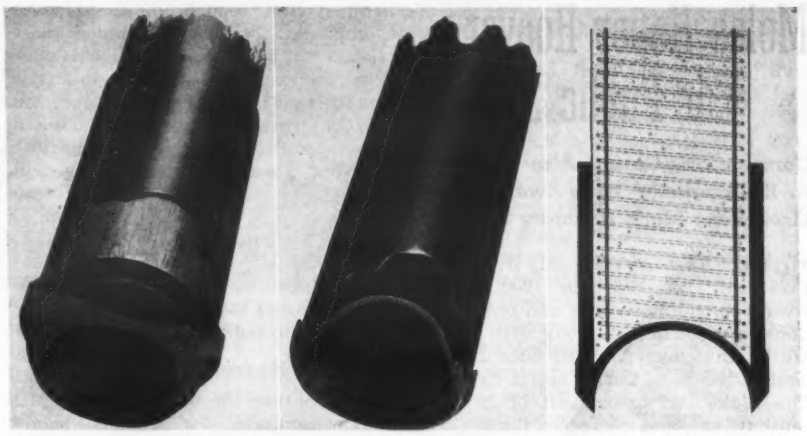
A new development announced by The Wellman Engg. Co., Cleveland, Ohio, is a 5-ton stone grab. It is fitted with three prongs for gripping and safely handling irregularly shaped stones. And the four-part closing-cable reeving develops enough force to eliminate the danger of dropping the load while it is being lifted on the closing cable, says Wellman. The grab weighs 2,200 pounds and when loaded to capacity is suitable for operation on most ¾-yard standard crawler cranes, according to the manufacturer. Larger or smaller units can be supplied as needed.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 39.

Load-Transfer Dowel Units

A descriptive booklet on dowel units has recently been prepared by Bethlehem Steel Co., Bethlehem, Pa. A transverse joint support for highway and airport concrete paving, the dowel assembly is easy to handle and install, the booklet points out, and nests quickly and conveniently. Two pages of diagrams illustrate standard details and assembly plans for Bethlehem dowel units. The booklet also describes field assembly of the unit both as a contraction joint and as an expansion joint.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 99.



Three styles of Cobi pile tips: for timber piles (left), for cast-in-place piles (center), and for precast piles (shown at the right). The last-named type is joined permanently to the pile by a welded-on collar.

New Pile Tip Design

A new Cobi cast-steel pile-driving tip for use with timber, cast-in-place, and precast piles features an inverted paraboloid design, a sharp cutting edge, and a shockproof shoulder. Available from the Albert Pipe Supply Co., Inc., Berry and N. 13th Sts., Brooklyn, N. Y., the Cobi tip is said to start easily, drive straight, give high bearing values, and center the load.

According to the company, the construction of the pile tip often eliminates the necessity of going down to hardpan or rock. With full ground contact over the entire area of the inverted paraboloid, a tightly consolidated pressure bulb of great density is built up. The company explains that the outer sleeve of the tip reinforces the wall of the pipe and does not act as a wedge or spreader.

When used with timber piles, the Cobi tip is said to give a full bearing over the entire area of the diameter of the pile, and to enable penetration through hard strata without splitting or brooming. No sharpening or resharpening of the pile is necessary. When used with cast-in-place piles, the tip is held by a tapered flange which hugs the outside of the pile in a frozen friction fit. It can be installed without mallets or sledges. The Cobi tip permanently joins to the precast pile by a welded-on collar.

Cobi pile tips are available in a range of sizes from 8 to 24 inches (in 2-inch increments) for cast-in-place precast piles, and in 6, 7, 8, and 10-inch sizes for timber piles. Tips for precast piles are furnished with a welded-on collar. On steel pipe, for cast-in-place piles, tips are available for either inside or outside-diameter fits.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 62.

Bulletin on Soil Mapping

The Highway Research Board's recently issued Bulletin No. 22 describes the use of agricultural soil maps in engineering and the status of agricultural mapping in the U. S. There are two articles in the bulletin. One, written by L. D. Hicks, Chief Soils Engineer, North Carolina State Highway and Public Works Commission, explains how soil maps may be used in conducting surveys for engineering purposes. The other, by Goeffrey B. Bodman, Professor of Soil Physics, University of California, points out the value of using county soil maps and other technical literature in making the preliminary estimates of soil properties for highway and airfield design studies.

The bulletin also contains a tabulation showing the present status of soil mapping in the U. S. It gives the map rating, year published, and places where maps may be obtained.

Bulletin No. 22 may be obtained by writing to the Highway Research Board, National Research Council, 2101 Constitution Ave., Washington 25, D. C. The price is $1.80.

Low-Cost MOTO-BUG Pays BIG PROFITS

Kwik-Mix Moto-Bug capacity is 1200 lb., 10 cu. ft. . . . moves 4 times as much as ordinary hand wheelbarrow. Takes *all* the pushing and pulling out of wheelbarrow work . . . has power in reverse as well as forward. Speeds 1½ to 4 m.p.h. You also get *standard-make* 4 h.p. air-cooled engine . . . easy steering *direct* to dual-wheel . . . platform body, dual drive wheels, riding step available.

KWIK-MIX COMPANY
KOEHRING SUBSIDIARY
PORT WASHINGTON, WISCONSIN

Easy-charging LO-BIN Holds 8, 20, or 30 Tons

Handy Lo-Bin Trolley Batcher is only 7½' high, holds 8 tons. Flared extension panels increase height to only 8½' for 20-ton capacity . . . and 9½' height for 30-ton. All are easily charged by front-end tractor loaders. Can be furnished with 2, 3 or 4 compartments, and up to 4 weigh beams. 3-compartment division is ¼, ¼ and ½. 22 cu. ft. hopper rides out beyond end of track, dumps directly into mixer skip. Optional mounting: wheels, pneumatic tires, tow-bar. Lo-Bin is quickly dismantled, easily moved job-to-job by dump truck.

C. S. JOHNSON COMPANY
KOEHRING SUBSIDIARY
CHAMPAIGN, ILLINOIS

310 TRENCHLINER* digs extra wide . . . extra deep

For smooth, clean-cut trenches 18" to 54" wide, 15' deep, see this extra-heavy-duty Parsons 310 Trenchliner . . . the largest full crawler mounted trencher made in the United States. Dual booms for flat or step-trench bottom cut as wide as 72". 3 smaller crawler-type Trenchliners also available. Ask, too, about utility-size, 18.5 m.p.h. Model 80 Trenchmobile on rubber tires, digs 4 feet deep.

*Trademark Reg. U.S. Pat. Off.

PARSONS COMPANY
KOEHRING SUBSIDIARY
NEWTON, IOWA

MILWAUKEE 10, WISCONSIN

Moles Honor Hoover For Public Service

Construction Group Also Presents R. E. Dougherty With Award; Gen. Eisenhower Made Honorary Member

✦ HERBERT HOOVER, only living ex-President, received the 1950 Moles Award for public service and contributions to construction, along with Richard E. Dougherty, retired Vice President of the New York Central System. The Moles, an association of heavy-construction men, conferred the honors at the society's tenth annual dinner on February 9 at the Waldorf-Astoria Hotel in New York City. Gen. Dwight D. Eisenhower, guest speaker at the affair, was made an honorary member of The Moles. The awards were bronze plaques and parchment citations.

The honor to Former President Hoover was the society's traditional non-member award conferred to a "Statesman, Humanitarian, Engineer in recognition of his superlative leadership in advancing human dignity, individual enterprise, and personal freedom; the foundations of a better world". Richard E. Dougherty, a member of The Moles, was honored "in recognition of his engineering leadership, and his tireless and unselfish service in promoting public safety, in advancing transportation standards, and in urban planning and development".

Carlton S. Proctor, President of The Moles, in introducing and presenting the award to Mr. Hoover, cited the ex-President's long public service, particularly the reports of the Hoover Commission. Mr. Proctor called these reports the outstanding current contribution to the construction industry, and for that matter to all of American free enterprise. The reports pointed out, he said, "the obvious fact that the mounting tax burden on business and industry, to support a constantly expanding and disintegrating Federal bureaucracy, must inevitably lead to such increase in spending and decrease in efficiency that the time will come when business will be unable to pay for what the politicians spend".

Hoover Speaks

In accepting the Moles award, Mr. Hoover reminded the gathering, composed of some 1,000 Moles members and guests, that "I belonged to your happy profession before I was thrown onto the slippery streets of public life". He pointed out that the engineer has certain disadvantages as compared to men in other professions. "His works are out in the open where all men can see them. He cannot deny he did it. The doctor's mistakes are buried in the grave. The voters forget when the politician changes the alphabetical names of his falling projects." He mentioned that lawyers can blame judges and juries for their shortcomings, but that if the works of an engineer do not work he is damned.

Mr. Hoover further sympathized with the engineer when a politician's name is put on what he has built, or "they credit it to some fellow who used other people's money with which to do it". He felt, however, that the engineer himself looks back at the unending stream of goodness which flows from his successes with satisfactions that few other professions may know. "Most people do not know it," he said, "but the engineer is a potent political, economic, and social force. By his applications of the discoveries of science he is the person who really devitalizes national demons, corrects monopolies, redistributes national wealth, and smooths out the rough spots in the social order."

Past national demons, Mr. Hoover recalled, were kerosene oil, canals, railroads, anthracite coal, and electric power, which the politicians cried out against so as to win elections. Later came public utilities and other national demons including Wall Street and the bankers. The fearsome visages of the latter, according to the ex-President, have today a distinct cast of sadness. "The Government," he asserted, "is now hi-jacking their job. Some day the engineers will prove that the Government financial operations can themselves become demoniac."

Years ago, Mr. Hoover related, engineers announced that the way to lift the standard of living was to eliminate waste and otherwise reduce the cost of production. Prices would come down and people could buy more and employ more people; hours could be shortened and wages increased. "A few years later," he added, "the economists also announced the discovery of this idea. But, it seems at times that the lawmakers have not yet heard it. At least, they are busy increasing waste, and pushing costs up by a variety of devices."

Eisenhower a Mole

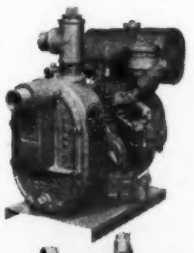
Gen. Eisenhower, now President of Columbia University, was presented with an honorary membership in The Moles because he was, according to Carlton S. Proctor, "the greatest war leader of all times". The General responded by saying that we should not hide the horrors of the H-bomb in ignorance, as we will not find protection by sticking our necks in the sand when we are faced across the sea by an aggressive and godless ideology.

(*Concluded on next page*)

Marlow Pumps

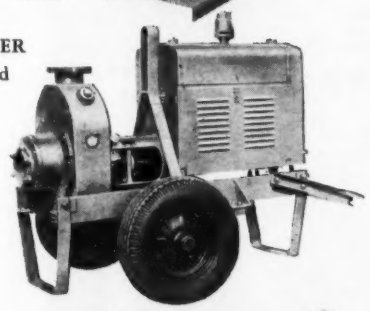
. . . sign of good pumping on construction jobs.

MARLOW MAKES THE WORLD'S MOST COMPLETE LINE OF CONSTRUCTION PUMPS

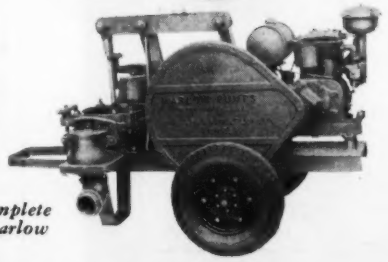


MARLOW MAKES BOTH TYPES . . . self-priming centrifugal and diaphragm . . . MARLOW MAKES THE LARGEST SIZE RANGE . . . 1½ to 10 inch, 3,000 to 240,000 GPH for the Water Wizard Self Priming Centrifugals. And for the Mud Hog Diaphragm Pumps — 3 and 4 inch single and 4 inch double, capacities to 9,000 gallons per hour. Steel wheel, rubber tire or flat-base mounted.

MARLOW OFFERS THE WIDEST POWER CHOICE . . . Gasoline or Diesel, air-cooled or water-cooled. Electric-driven. Belt-driven. PLUS EXCLUSIVE MARLOW FEATURES . . . In the centrifugals; fast, automatic, trouble-free priming and repriming, by the exclusive diffuser method. In the diaphragm pumps: patented non-clogging valves. And other exclusive features.



Wherever pump users gather you will hear the name MARLOW used as a standard of pump efficiency, trouble-freedom and long life. It will pay you, too, to standardize on the standard.



Write the Marlow factory for complete information and the name of the Marlow dealer nearest you.

MARLOW PUMPS 555 GREENWOOD AVENUE RIDGEWOOD, NEW JERSEY

MANUFACTURERS OF QUALITY PUMPS SINCE 1924

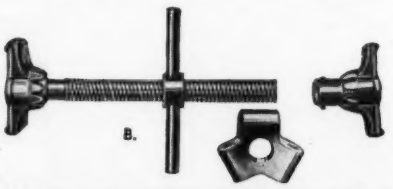
PREVENT COSTLY *Cave-Ins* WITH

DUFF-NORTON

TRENCH *Braces*

Make Trenches Safe for Workmen

Unexcelled for safe and economical bracing of all trench and excavation jobs . . . Duff-Norton Trench Braces are of strong construction . . . easy to install, easy to maintain when not in use. Write today for full information and proposal on your requirements.



A. This type is supplied complete with pipe (1½" or 2") in lengths from 16" to 60" to suit your needs.

B. Steel fittings only are supplied without pipe if desired. Used with 1½" and 2" pipe.

C. Steel timber brace fittings are furnished without timbers for use with 4" x 4"—6" x 6" and 8" x 8" timbers.

See your local distributor or write for Catalog 203-D

DUFF-NORTON JACKS — STRENGTH SAFETY DURABILITY — ESTABLISHED 1883

THE **DUFF-NORTON** MANUFACTURING CO.

MAIN PLANT and GENERAL OFFICES, PITTSBURGH 30, PA.—CANADIAN PLANT, TORONTO 6, ONT.

"The House that Jacks Built"

Then turning to Mr. Hoover, Gen. Eisenhower remarked that "in my book he was a pretty good President. He defends all that has made the United States great. To my mind he is the exemplification, the symbol of what has made America great." The General then went on to praise the work of the Hoover Commission in recommending governmental economies. "We all should be interested in saving money," he declared, "whether we are Democrats or Republicans, or like myself, just an old soldier."

Dougherty Reviews

Richard E. Dougherty, retired Vice President of the New York Central System, in accepting his award reviewed some of the problems solved by various member Moles in the building of great engineering structures. While their work is frequently unheralded and unsung, he stated, they have the satisfaction of bearing the responsibility for the fundamental and basic operations of the heavy-construction industry.

Five Diesel-Driven Generating Plants

Five new diesel-driven electric generating plants, equipped with automatic voltage regulators and ranging from 12½ to 55 kw, have been added to the line manufactured by D. W. Onan & Sons, Inc., Minneapolis, Minn. Available in all standard voltages, frequencies, and phases, they are designed to give low-cost electric power by operating on fuel oil.

Powered by International Harvester low-speed engines, these new units feature all-weather gasoline-engine starting with the dependability and economy of full diesel operation. The engine is cranked by a 12-volt starting system similar to that on any conventional gasoline engine, the company says. A lever controls the changeover to full diesel operation. A battery-recharging generator is provided.

The units are equipped with Onan voltage-regulated-type generators, which may be paralleled. Permanently aligned, they are designed and constructed for operation under all climatic conditions. Basic models are furnished with necessary engine and generator controls, automatic voltage regulator, and running-time meter. Standard equipment includes exhaust muffler, battery cables, and terminal box. Optional equipment includes: voltmeter, ammeter, circuit-breaker paralleling equipment, high water temperature and low oil pressure alarm or cut-off, steel skid base, battery rack, batteries, exhaust snubbers and fuel tanks, and fuel lines with fittings.

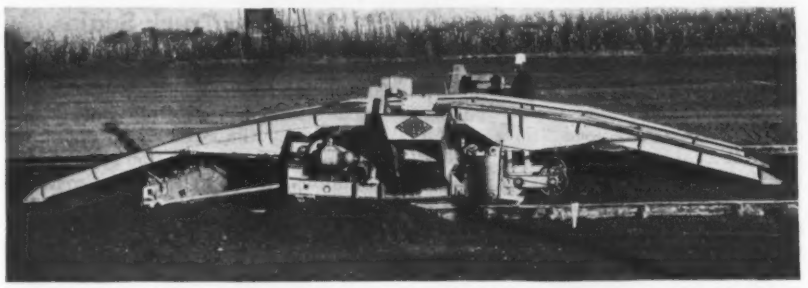
Further information may be secured from the company by requesting Form A-192. Or use the Request Card at page 16. Circle No. 101.

Vibratory Subgrader With Truck Overpass

The accompanying illustration shows the latest model of vibratory subgrader manufactured by Blaw-Knox Co., Farmers Bank Bldg., Pittsburgh, Pa., in operation on a 22-foot concrete paving job near Oskaloosa, Iowa. This model is usable for road widths from 20 to 25 feet and is equipped with a crossover bridge for batch trucks.

The machine applies a vibratory force of 2,000 impulses per minute to the forward edge of the cutting blades. This, the company says, develops great efficiency in cutting through the earth and shaving the subgrade. A method of insulation and control directs the vibrations into the ground without transmitting shock or movement into the road forms.

The machine's cutting blades and strike-off are quickly adjusted for crown. The warping of the subgrade from flat to crown, or the reverse, can be accomplished without stopping the forward motion of the subgrader. Batch trucks can traverse the crossover while the machine is in motion.



Near Oskaloosa, Iowa, a Blaw-Knox vibratory subgrader at work on a 22-foot concrete paving job. Notice the crossover bridge for batch trucks.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 48.

Data on 6,000-Pound Hoist

Bulletin No. H-414 describing the Lidgerwood 250 Series hoist, built for handling single-line pulls from 4,000 to 6,000 pounds at rope speed of 200 to 250 fpm, has been issued by Superior-Lidgerwood-Mundy Corp., 7 Dey St., New York 7, N. Y. These hoists, the literature points out, are basically two-drum machines but can be supplied as single-drum units with provisions for adding a second or third drum and swinging gear in the field. Left and right-view photographs are given of the lightweight units and complete specifications are listed for all parts.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 27.

IN ANYBODY'S LANGUAGE-

Bethlehem Wire Rope Means Low Cost Per Unit of Work

In country after country all over the world Bethlehem wire rope has consistently proved its basic economy. Reason: its long life in service, which means low cost per unit of work—the only *true* yardstick of rope costs.

Every wire rope will do a certain amount of work, and it is often possible to record this in terms of definite units. That is, throughout its life the rope will move so many cubic yards of rock, or haul so many loaded cars up a hill, or lift and lower so many tons of drill pipe through varying distances, etc. Obviously, the rope cost should not be measured by purchase price alone, but by the cost of each unit of service the rope gives you.

In other words, the rope with the low price tag may look like a bargain, yet render such limited service that the cost per unit of work is high. On the other hand, a quality rope—costing more at the time of purchase, perhaps—can be a *real* bargain because of the long-term, efficient job it does.

Bethlehem wire rope is a quality product, made by craftsmen in one of the world's finest mills. It is built to give the user *low* cost per unit of work . . . to give him his money's worth and more. You can buy it with confidence; use it with the knowledge that it will serve you long and well.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.
On the Pacific Coast Bethlehem products are sold by
Bethlehem Pacific Coast Steel Corporation
Export Distributor: Bethlehem Steel Export Corporation

Chicago Pneumatic developed this G-150 lightweight wagon mounting to handle sinker drills of the 55-pound class or 3-inch drifters.

Light Wagon Drill

The recently developed G-150 lightweight wagon mounting for handling sinker drills of the 55-pound class, or 3-inch drifters, is now available from the Chicago Pneumatic Tool Co., 6 E. 44th St., New York 17, N. Y. Designed to eliminate operator fatigue, this mounting increases footage per shift as compared to hand-held drills. The standard drill carriage is of channel construction and provides a 6-foot steel change, but special longer changes are also available. A rotary-type air motor with graduated control, worm-gear transmission, and feed chain gives a steady feed with quick return and ample power for pulling tight steel. The control is such that the drill will not plunge if the steel breaks, the company says.

The chassis is of tubular construction and is designed so that the feed motor can be used to raise the frame from minimum to maximum height. The feed and drill control can be adjusted to any position along the drill carriage. The powered steel puller eliminates wrenching of steel and loss of holes in bad drilling ground, according to CP. A universal-type saddle, adjustable laterally on the crossbar, permits positioning for drilling at any angle. A sliding cone allows adjustment for uneven ground conditions. Ball-bearing wheels with pneumatic tires facilitate moving.

Further information may be secured from the company by requesting Bulletin SP-3010. Or use the Request Card at page 16. Circle No. 76.

Earth-Moving Equipment

A 12-page catalog describing diesel wheel tractors, Mississippi Wagons, and bulldozers in earth-moving operations is available from the M-R-S Mfg. Co., Jackson, Miss. Fully illustrated with on-the-job photographs, this folder explains the operating features and lists specifications for each of the units manufactured by the company.

Highlight of the folder is its discussion of the towing-type tractor and the exclusive weight-transfer principle of M-R-S Model 125A. This unit is designed with approximately 70 per cent of the total tractor weight on the drive axle—and the drive wheels equipped with soft pliable low-pressure drive tires, normally carrying 14-pound air pressure. The weight-transfer principle enables the tractive effort on the drive wheels to be appreciably increased by transferring a portion of the trailer load by means of a hydraulic cylinder mounted at approximately a 45-degree angle between the tractor drive axle and the front of the wagon or scraper. This action produces approximately 62 per cent more ground contact area with the same tire, according to the catalog.

The Mississippi Wagons are particularly designed for use with a towing type of tractor. The four-axle construction of the combined unit makes it possible to haul larger payloads without exceeding axle load limits. These units, the folder explains, may be used for hauling, dumping, spreading, or windrowing on any job. Trailer capacities range from 8.5 to 13 struck yards.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 24.

An Automatic System Adds Water to Paver

A fully automatic water system, hydraulically controlled, is now standard equipment on Worthington-Ransome 34-E dual-drum pavers, according to an announcement by the Ransome Division of Worthington Pump & Machinery Corp., Dunellen, N. J. It is designed to simplify operation of the machine, assure a more uniform mix, and eliminate the possibility of wet or dry batches due to carelessness.

The automatic system goes into operation when the skip is approximately 4 feet off the ground, and closes the water valves completely when the required amount of water has entered the drum. An automatic water cut-off delaying action, adjustable to a maximum of 12 seconds, eliminates the need for the paver operator to hold the skip up until the proper quantity of water has been discharged.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 2.

Bituminous Fiber Joint

A bulletin highlighting the features of Flexcell, a bituminous fiber expansion joint, has recently been issued by The Celotex Corp., 120 S. La Salle St., Chicago 3, Ill. Principal characteristics cited are that it is non-extruding, resilient, compressible, durable, moisture-resistant, workable, economical, uniform, and versatile. The catalog checks and compares the qualifications of Flexcell and suggests applications. The joint material is available in thicknesses of ¼, ⅜, ½, ¾, and 1 inch, in widths of 4, 5, 6, 36, and 48 inches.

This literature may be obtained from the company, or by using the Request Card which is inserted at page 16. Circle No. 84.

Portable Truck Scales

A new descriptive folder showing 18, 20, 25, and 30-ton-capacity portable truck scales has recently been made available by the Scale Division of the Thurman Machine Co., 156 N. Fifth St., Columbus, Ohio. The scales, made in 18, 22, 24, and 30-foot platform lengths, are moved from job to job by removing six nuts which hold the side arms in place. The rest of the unit can be placed on a flat-bed truck by using a crane, winch, or front-end loader. Specifications and descriptions are given.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 47.

Morse-Starrett
WIRE ROPE CUTTER
CUTS WIRE ROPE
FASTER . . .
Especially designed cutting blade and dies assures fast cutting action. . . . . The hammer principle eliminates any special skill requirements.
CLEANER . . .
No jagged ends. The wire rope is cut with ends smooth and clean for perfect threading or splicing.
SAFER . . .
The enclosed cutting blade locked in the body of the cutter assures perfect safety.
and it's
PORTABLE . . .
Models for tool kit or stationary operation. With cutting capacities up to: 1 inch, 1 1/16 inch, 1½ inch.
SEE YOUR DEALER OR WRITE DEPT. "M"
Morse-Starrett Products Company
1204 - 49TH AVENUE, OAKLAND 1, CALIF.

it's "The Jet"
with DC-6 CONTROL
DIRECT CAB
CAPACITY
7
CUBIC YDS.
FOR SEAL-COATING . . . ICE AND SLEET CONTROL
Good Roads MACHINERY
WIDTH OF SPREAD:
FROM 12 TO 28 FT. FOR SEAL-COATING.
FROM 12 TO 60 FT. FOR ICE AND SLEET CONTROL.
DC-6 CONTROL - - - - - - - - -
Ignition, Starter, Flasher Lights, Clutch, Choke, and Throttle are fingertip controlled from the truck cab. Fits any truck.
STEEL BELT CONVEYOR - - - - -
The controlled intermittent action shakes materials down through the wide throat onto the twin spinner discs.
UMBRELLA SPREAD - - - - - - -
Material is confined to a low horizontal plane thereby protecting traffic.
WATERPROOF, AIR-COOLED MOTOR - -
A powerful unit capable of driving the twin spinners at a speed of 2400 r.p.m.'s.
SPREADS ANY MATERIAL:
SAND
GRAVEL
LIME
SALT
CINDERS
CALCIUM-CHLORIDE
ANY OTHER DESIRED
Contact your Good Roads Dealer or factory for further detailed information or a demonstration
GOOD ROADS MACHINERY CORP. - - - - - - - - - - MINERVA, OHIO

Any material that can be attached to wood with nails or screws can be attached to the Macomber Steel V section, says its manufacturer.

Nailable V-Bar Joist

A section designed to provide secure attachment for any material that can be nailed, welded, or attached with screws is fabricated in a variety of sizes by Macomber, Inc., of Canton, Ohio. The product is the Macomber V-bar joist, a nailable steel section engineered to specific load-carrying capacities.

When a nail is driven into the steel section, the oversize diameter of the shank makes it force or cut its way into the tightly necked-in area of the nailing groove. This groove is set for eightpenny nails or No. 7 screw-size spiral nails recommended for anchoring flooring. As all covering materials except metal lath are in the blind nailing classification, the Macomber V-section has a ⅜-inch curved throat which guides the nail into the groove; as it enters, there is the same feel as there is in driving into a tightened vise, the company explains. Pull tests performed by the Pittsburgh Testing Laboratory found the gripping effect superior to that of wood.

Made in depths ranging from approximately 8 to 20 inches, these joists are designed to endure resisting moments up to 355,500 inch-pounds. Macomber also embodies its nailable-section principle in load-bearing partition studs and lightweight roof trusses.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 121.

New Pipe Threader

The Quijada Chief, an improved ½ to 2-inch portable pipe and bolt threader, has recently been announced by the Quijada Tool Co., Inc., 5474 Alhambra Ave., Los Angeles 32, Calif. The Chief is successor to the Quijada Model 3-A.

New features include 4 front jaws that automatically grip the pipe, and 4 rear jaws that automatically center it to eliminate whipping even on the smaller sizes. Chucks are operated automatically when the improved push-pull switch is actuated. The chip pan slides out for easier cleaning.

Cutting oil is now transmitted from the oil pump through telescoping oil lines directly onto cutting surfaces. The Chief utilizes a die head for each size of pipe. An improved reamer is attached to each head and reams while threading. When the proper length of thread is cut, a bell rings, notifying the operator to open the die head. The cutter assembly is mounted conveniently for cutting off.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 69.

Directs Truck Sales, Midwest

F. Jule Weiland has been appointed factory sales representative for Federal Motor Truck Co. in Wisconsin. He will direct dealer relations and sales promotion programs for the company in Wisconsin, upper Michigan, and northeast Minnesota.

Shovels, Spades, Scoops

A 32-page illustrated catalog and price list on the Ingersoll Xtra Quality shovels, spades, and scoops has recently been offered by the Ingersoll Steel Division of the Borg-Warner Corp., New Castle, Ind. Made of TemCross, an Ingersoll process steel, the shovels are available in three series: plain back, solid shank, and hollow back. Specifications, dimensions, and prices are given for every size, type, and model. Each of the styles is illustrated.

A wide variety of blades is presented in the bulletin. Made in three different grades, most blades are heat-treated. The Alloy, A, and B grades may if desired be face-polished. Certain items, mainly scoops, may be galvanized. Ten types of handles are illustrated. These are available in three different grades, to meet the requirements of individual users.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 115.

Van Dorn POWER helps you SAW 10 TIMES FASTER!

Speedy Van Dorn Electric "Quick-Saws"* beat hand sawing 10 to 1! Rip, crosscut, miter, dado; in wood, compo-board, tile, galvanized sheet, etc. Easy adjustment for angle and depth of cut. Completely safe. Easy to handle. Models for cutting to depths of 2⅜", 2⅝", 3⅛". See your nearby Van Dorn Distributor. Write for catalog to: THE VAN DORN ELECTRIC TOOL CO., 787 Joppa Road, Towson 4, Maryland.

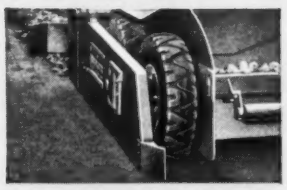
*Trade Mark Reg. U. S. Pat. Off.

FOR POWER SPECIFY "Van Dorn" PORTABLE ELECTRIC TOOLS

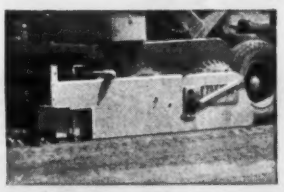
(DIV. OF BLACK & DECKER MFG. CO.)

JAEGER paver-type AGGREGATE SPREADER

the low-cost, accurate, self-propelled spreader you've been looking for



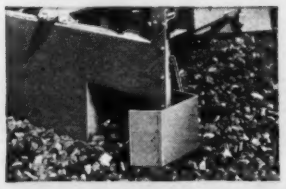
ALL TRACTION ON SUBGRADE or compacted course. No displacing of loose material. 4-wheel drive.



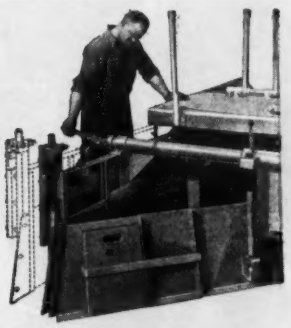
STRAIGHTEDGE RUNNERS carry screed independent of rest of machine, average out subgrade irregularity, insure accurate lay.

LAYS MANY MATERIALS: The Jaeger is adaptable for free-flowing bituminous mixes as well as all aggregates up to 4" stone.

UP TO 25' IN TANDEM: Use 2 low-cost spreaders to lay and roll full-width base. Keep your costlier paver busy on top course.



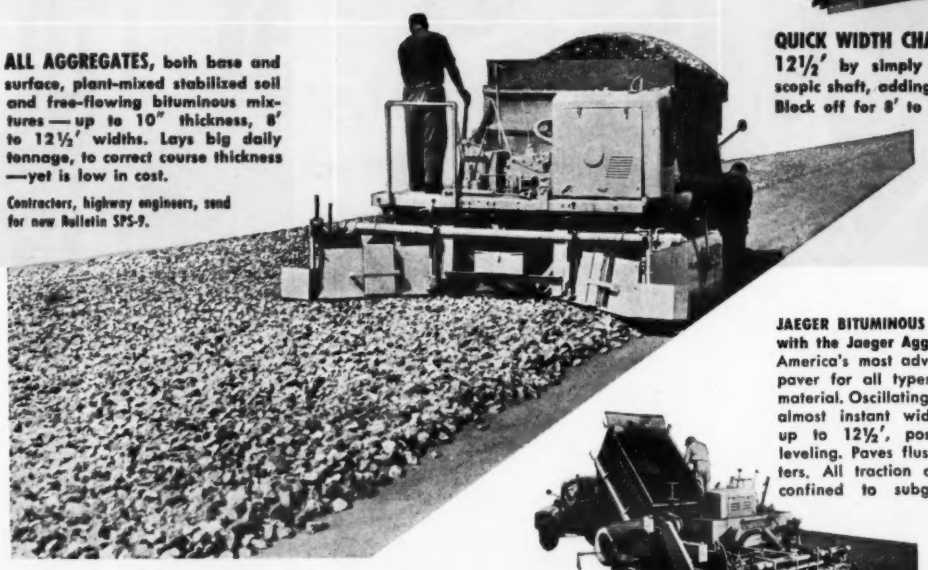
BLENDS PERFECT JOINTS: Side control gates furnish material for blender wings to form joint. Saves hand work.



QUICK WIDTH CHANGES, 10' to 12½' by simply cranking telescopic shaft, adding screed inserts. Block off for 8' to 10' widths.

ALL AGGREGATES, both base and surface, plant-mixed stabilized soil and free-flowing bituminous mixtures — up to 10" thickness, 8' to 12½' widths. Lays big daily tonnage, to correct course thickness —yet is low in cost.

Contractors, highway engineers, send for new Bulletin SPS-9.



JAEGER BITUMINOUS PAVER "Teams" with the Jaeger Aggregate Spreader: America's most advanced precision paver for all types of bituminous material. Oscillating tiltable screeds, almost instant width adjustability up to 12½', positive automatic leveling. Paves flush to curbs, gutters. All traction and heavy load confined to subgrade. Ask for Catalog BP-9.

CONCRETE PAVING CONTRACTORS: Get labor-saving mass-production with Jaeger Diagonal-Screed Finisher and Screw Spreader "Team". Ask for catalog.

THE JAEGER MACHINE CO., Columbus 16, Ohio

Distributors in 130 Cities of the U.S. and Canada

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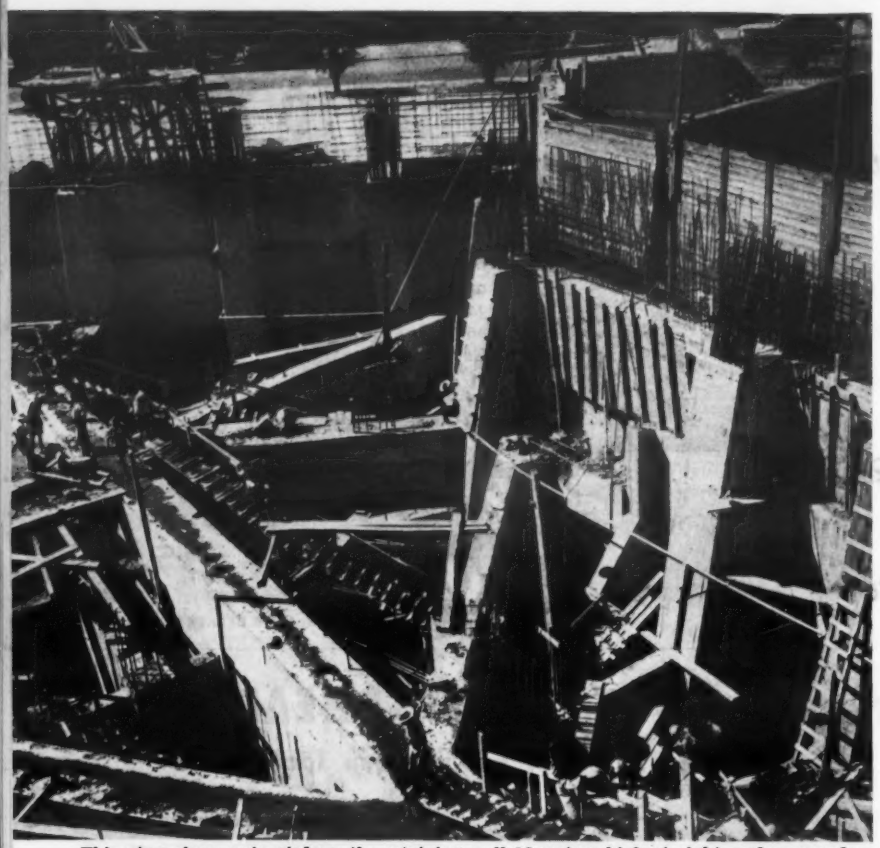
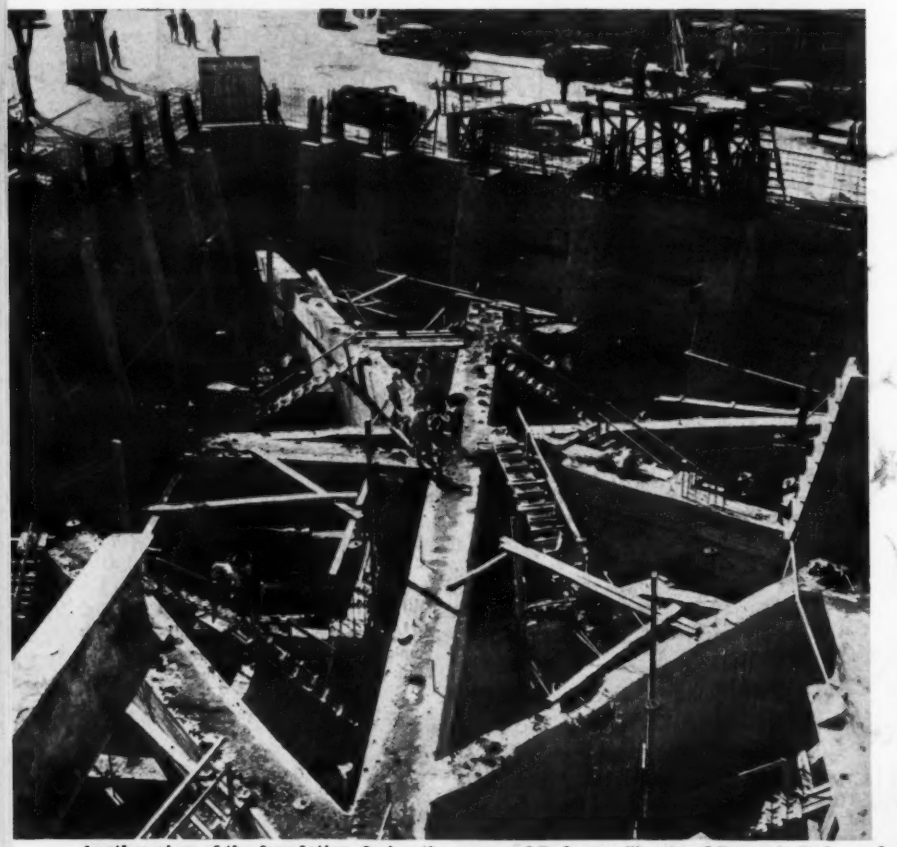
PUMPS • AIR COMPRESSORS • MIXERS



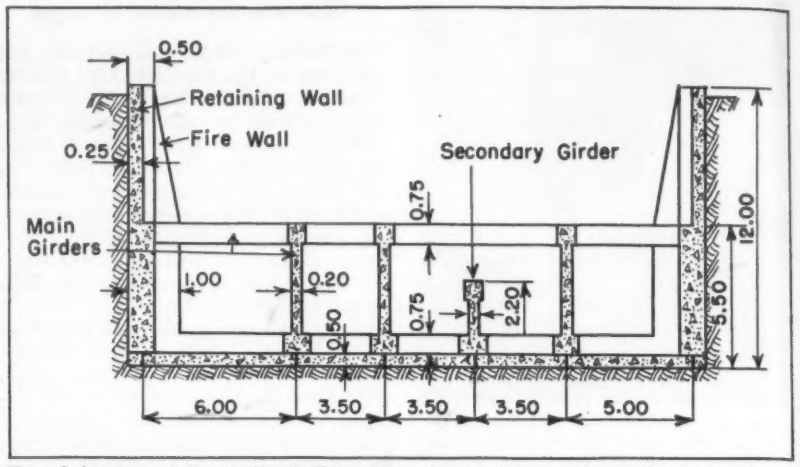
This view show main girders, the retaining wall 12 meters high at right, and a secondary girder at the extreme left. Secondary girders are supported by the main network.



Another view of the foundation, facing the corner of Lafragua Street and Paseo de Reforma.

Workmen brought baskets of clay out of the excavation, and . . .

A platform hoist driven by a gasoline engine lifted the material to trucks to be carried away.



The substructure of the Aguilar Building is a network of main and secondary concrete girders bounded by a concrete retaining wall and bottom slabs. Measurements noted in this diagram of a section of the substructure are in meters.

Floating Foundation For Mexican Building

Network of Concrete Walls And Girders Built and Sunk Into Ground So As to Displace The Weight of the Building

By ALBERT S. KESHEN

✦ CONSTRUCTION of the 20-story Aguilar Building in Mexico City, at an estimated cost of 10,000,000 pesos, illustrates the practical difficulties faced by engineers there in founding heavy buildings on the spongy clay which underlies the city.

When Cortes and his adventuresome Spanish conquerors came to the capital of the Aztecs, they found it somewhat like Venice, with Lake Texcoco occupying most of the area, and the Indians crossing back and forth over large causeways or in canoes. Historians say it was the largest lake in the Valley of Mexico, covering about 30 square kilometers (12 square miles) and extending to the forest of Chapultepec on the west and an equal distance to the east. Since that remote time it has steadily diminished in size until now, with the neighboring Lake Chalco, it is practically dry. The waters were filled in by debris, remains of the Spanish conquerors and their Indian antagonists, toppled-in temples, and other ruins.

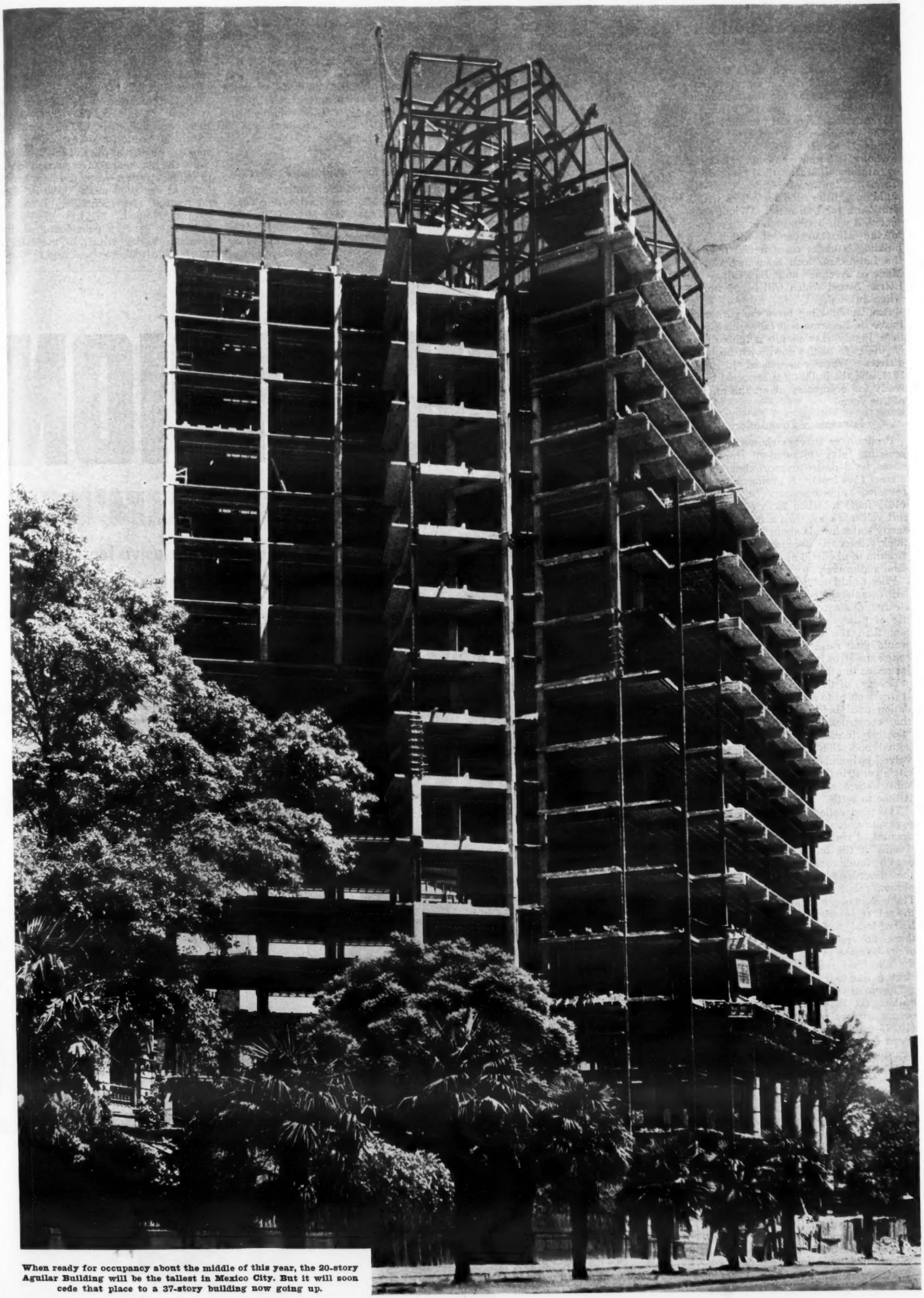
Not only is the whole plateau on which Mexico City is built (elevation about 7,500 feet above sea level) gradually settling, but also local settlements are occurring where buildings are too heavy for the soft clay on which they are founded. Where a building is too heavy for the carrying capacity of the soil, the structure settles faster than the surrounding streets.

Levelings referred to bench marks set on the hills have shown that the surface of the city is sinking with an accelerated movement and that in the last 10 years, in the central part alone, the sinking mean has been 15 centimeters (6 inches) per year.

The problem of constructing a stable foundation over the former lake bed confronted the engineers of Ingenieros

(*Continued on page* 52)

Here we see the start of steel erection, which was handled by Pacific Bridge Co. Ingenieros Civiles Asociados, S. A. de C. V., built the floating foundation.



When ready for occupancy about the middle of this year, the 20-story Aguilar Building will be the tallest in Mexico City. But it will soon cede that place to a 37-story building now going up.

Floating Foundation For Mexican Building

(*Continued from preceding page*)

Civiles Asociados, S. A. de C. V., when they were charged with a project costing 1,260,000 pesos for the foundation work alone. (The peso is valued at 11½ American cents at present.)

The owner of the property is Luis Aguilar, President of Gerber Sucessos, a wholesale liquor company. Designed by architects Mario Pani and Jesus Garcia Collantes of Mexico City, the building will be used for offices with a penthouse for the owner. When completed, it will be the highest skyscraper in the Mexican capital, although a building is under construction now by the Latin-American Insurance Co. at Madero Avenue and San Juan de Letran Street which will be 37 stories when finished.

Aguilar Building faces the corner of Paseo de Reforma and Lafragua Street in a highly fashionable neighborhood on the edge of the downtown business district. Work commenced in May, 1947, and the building is expected to be ready for occupancy about the middle of this year.

Principle of Foundation

Preliminary surveys showed a compressible clay foundation from the street level down to approximately 50 meters (164 feet). A geological profile revealed approximately a 5-meter (16½-foot) fill, then 28 m (92 feet) of soft volcanic clay, then a hard layer of sandy soil which is about 3 m (10 feet) thick, then a second compressible stratum of about 16 m (52½ feet), then sand and gravel.

Piles would not have solved the problem completely because of this second stratum of clay. Furthermore, with the use of piles the building would settle less than the street. The movement would then raise the building relative to the street, as has happened in several instances to other edifices.

Because of these practical difficulties it was decided to employ a type of foundation used before in Mexico City in the construction of buildings — the "floating foundation". However, the actual operation in this instance involved a brand-new technique in the city's construction history—sinking the substructure in place by degrees, giving it time to settle.

The plan called for the removal, in excavating for the foundation, of an amount of soil equal in weight to the weight of the building itself. With a floating foundation, the building follows the movement of the clay without motion relative to that of the street. The weight of the building thus balances the soil removed to eliminate the problem of local settlements. Theoretically there are no settlements, but some occur because of the recompression of the clay and remolding of the upper stratum due to the construction.

The total weight of the proposed building is 18,000 metric tons and it covers an area of 1,020 square meters (10,975 square feet). The builders allowed for one meter more, and workmen digging down 11.8 meters (39 feet) below the street surface took out 15 tons per square meter (2,700 pounds per square foot).

Ordinarily this procedure is not recommended when there are buildings contiguous to the excavation. But in this instance, an old building in the last stages of decay was next to the project on one side, while on the other side is a garden.

In this particular case, the salient features of the method carried out were as follows:

1. Excavation to 4 meters (13 feet) of depth, measured from the existing level of filled-in ground.
2. Construction of a network of beams and retaining walls.
3. Sinking of the substructure through its own weight.
4. Positioning of a vertical drain of gravel in order to avoid the local faults caused by seepage.

Soil Studies

Before the foundation was designed, soil studies were made by testing undisturbed samples taken from the ground at the site. The Boring Pc 28 profile showed variations of void ratios and unconfined compressive strengths of the several volcanic clays, from elevation minus 5.00 m to minus 70.00 m. A simplified profile of the site follows:

Elev.	0.0	to	— 5	m fill
Elev.	— 5	to	—33	m upper compressible stratum
Elev.	—33	to	—36	m hard sandy layer
Elev.	—36	to	—52	m lower compressible stratum
Elev.	—52	to	—62	m sand and gravel

The soft clay, with very high void ratios and saturated with water, acts like a sponge, is very compressible, but has some internal structure. When this internal structure is destroyed, it becomes very plastic. Therefore it was important to select methods of construction to retain mechanical properties of the clay, and to avoid disturbing the clay in the neighborhood. If properties change, then the clay is worsened.

Solving the Foundation Problem

Among the possible solutions when a building has to be placed over a compressible stratum as in Mexico City, two are the commonest: (1) transfer of the loads of the building to a hard layer by means of piles; and (2) excavation of an amount of earth equal to or near the weight of the building in order to minimize settlements due to consolidation of the compressible layer.

The decision to use the latter method instead of piles was arrived at because of the following reasons:

1. The thickness of the compressible stratum, 28 meters (92 feet), would have necessitated the use of piles made of three sections. Joints are weak spots on elongated piles of this type.
2. The existence of a second compressible stratum below the hard sandy layer at elevation minus 33.00 m; thus differential settlements could not be entirely avoided.
3. The general subsidence of the Mexican Valley which in the last 10

(*Continued on next page*)

CHAMPION
WORKIN'EST
Here are some of the exclusive features that give the TD-24 its matchless work capacity:
1. 180-h.p. International diesel engine with gasoline-conversion starting and unmatched "lugability".
2. Synchromesh transmission for easy shift-on-the-go operation; plus eight speeds forward and eight reverse.
3. Planet Power drive, smooth and rugged, for instant speed change up or down one gear without declutching.
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5. Separate reverse lever for quick change of direction of travel in any of the eight transmission speeds.
6. High-speed track assemblies with new recoil mechanism that holds front idlers in position against full-load track pull.
The NEW TD-24
CRAWLER TRACTORS • WHEEL TRACTORS
DIESEL ENGINES • POWER UNITS
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years amounted to 1.40 m. The result is that buildings on piles are apparently rising.

4. Steel piles, driven to elevation minus 52.00 m into a layer of sand and gravel 10 m thick, were considered; but due to economical reasons and the general-subsidence factor cited, they were rejected.

After evaluating these considerations, the engineers decided on the following features of the floating-foundation principle:

1. A reinforced-concrete substructure rigid by itself.

2. Depth of excavation 12 m, since the net load at elevation minus 12 m is equal to approximately 2 metric tons per square meter, or 18,000 metric tons, the total weight of the building.

3. Retaining walls and bottom slabs waterproof.

Design of Foundation

The foundation structure is a network of reinforced-concrete girders, bounded by retaining walls 12 m high and bottom slabs 0.40 m average thickness. It is irregular in shape, but measures approximately 40 x 25 meters. For the design the network was assumed to be divided into two systems: the main girders and secondary girders (see sketch on page 50).

Applying the relaxation methods, bending moments and shear stresses were computed in the main system. The secondary girders were assumed to be simply supported by the main network and no interaction between them was considered.

Setting of Substructure

The entire job was done by shovels and manual labor because of the low wage scale as compared to that in the States. The clay was brought out by workmen in baskets and placed in two hoists, operated by a gasoline engine, for removal to standing trucks. Wells were used for unwatering.

First, workmen made an excavation in the fill 4 m deep and then poured lean concrete at the bottom. This false slab insured a clean and firm surface during the setting operations. It was removed when sinking operations started. No sheeting was used at the perimeter. The main girders were 5 m high, secondary girders 3½ m, and retaining walls 12 m, with the bottom slabs 50 centimeters (20 inches) thick. The intersecting girders formed a network of cells or chambers in the substructure.

Then the drain was lowered and excavation made in the cells from elevation minus 4.00 m to elevation minus 4.50 m. Stripping of the earth prisms was done below the footing of main and secondary girders. The shear strength of the earth prisms was overcome and the substructure sank under its own weight (about 5,000 metric tons) to elevation minus 4.50 m.

The last two steps were repeated without any trouble until elevation minus 8.40 m was reached. At that level cracks were detected at the street surface and around the foundation structure in a zone that was about 4 m wide. Bench marks set inside the cells at elevation minus 15.00 m also started to show upheavals. These movements were attributed to side-friction and seepage forces.

To minimize the side friction, a sloping trench 3 m deep was dug outside the retaining walls. Seepage forces due to the pumping inside the foundation were controlled by means of borings 10 inches in diameter filled with gravel. These borings were drilled by an electrically operated auger to elevation minus 15.00 m at the center of the cells located on the perimeter of the foundation structure.

Sinking of the foundation structure was continued in the same way (that is by lowering the drain and excavating the cells, letting the substructure sink of its own weight) to elevation minus 11.50 m. Compression tests were made at regular intervals on samples of clay taken directly from the bottom of the working surface.

In spite of borings and trenches around the construction, cracks developed outside the boundaries of the foundation, some of them 8 m from the retaining walls. One Sunday one of the pipe lines cracked and the foundation was filled with water.

At elevation minus 11.50 m the sinking process was stopped. Reinforced-concrete slabs 0.40 m in average thickness were poured at the bottom. These slabs are freely supported on the footing of girders. The concreting of slabs proceeded from the perimeter of the foundation to the center of it. Joints between the slabs were finally grouted with cement.

Concreting Operations

Concrete was mixed at the site in a Mixermobile and conveyed to wooden forms by wheelbarrows and chutes; it was vibrated as it was placed. Standard portland cement, sand, and natural mine aggregates were used in the concrete. The weights in a typical batch were:

Cement	500
Sand	980
Coarse aggregate	2,150

A total of 3,060 cubic yards of concrete were required for the foundation; it was reinforced with 770,000 pounds of steel.

Tilting Tendency Noted

During the sinking process there was observed a tendency of the foundation structure to tilt. This tilting was erratic and it might possibly have been connected with the differences in the developed side friction on the retaining walls. Unconfined compressive strength was determined daily at several points of the layer being excavated in order to have a good control of stripping work on the earth prisms before failure of them.

In order to have an estimate of the average side friction on the retaining walls, acceleration of the structure during the sinking operation was measured. Computations showed that the averag side friction was constant from differ

(*Concluded on next page*)

# of Crawlers
TRACTOR ON ANY JOB

● *"THE TD-24 is definitely outhauling every other tractor on the job. It will do so much work that we are sure our job costs will show a great saving!"* That's the report of the foreman on the 247,000-yd. University of Maryland stadium project. ● *"I don't have to stop on any grade,"* the operator reports, *"and we have 25% or better on this job. Why, I just go up in 4th gear easy while the other tractors have to switch to low to make it."* And the TD-24 hauls a 17-yard scraper, heaped! ● Yes, the TD-24 is the "workin'est tractor" on any job. Yet, its operator is the worker with the easiest day! See your International Industrial Power Distributor. Get a TD-24 demonstration. Discover how you, too, can save job time, cut costs, earn extra profits.

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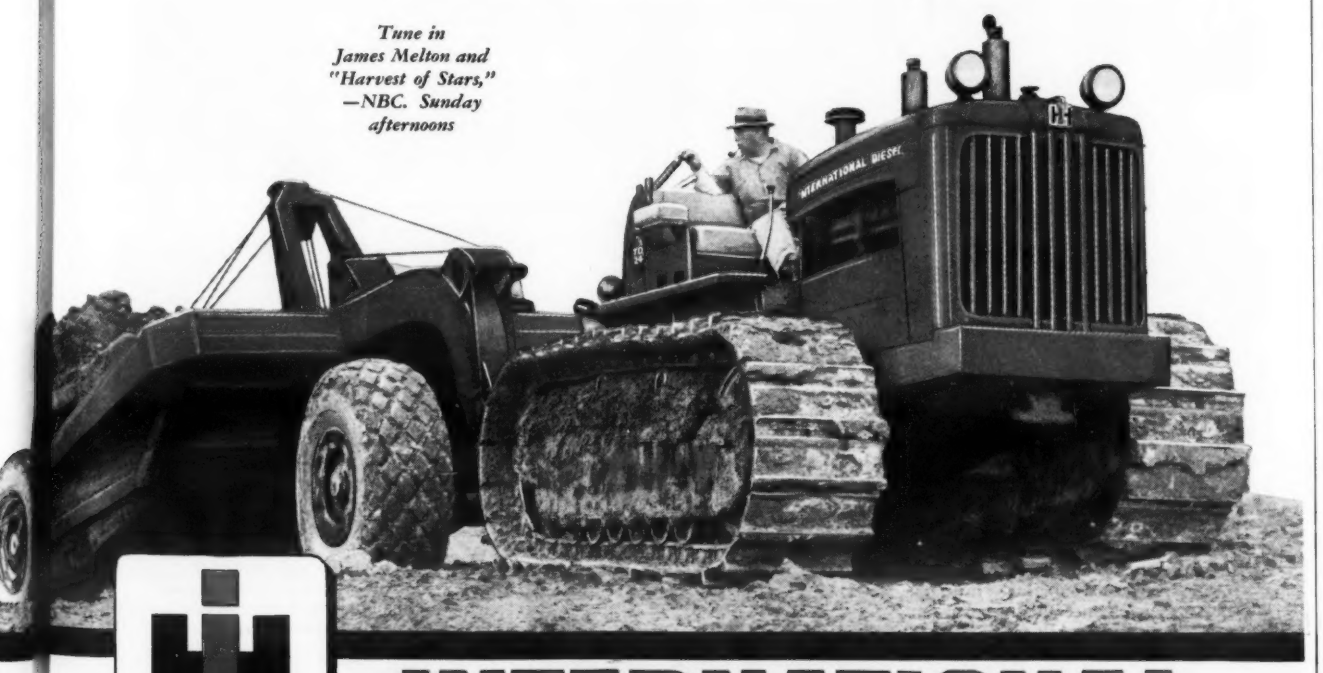

INTERNATIONAL HARVESTER

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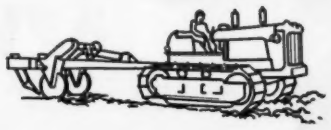


Floating Foundation For Mexican Building

(*Continued from preceding page*)

elevations and equal to 0.5 kg/cm². The average unconfined compressive strength was 0.5 kg/cm².

Personnel

The foundation for the Aguilar Building was built by Ingenieros Civiles Asociados, S. A. de C. V. Directly responsible for the job were Raul J. Marsal, in charge of soil-mechanics study; Raul Sandoval and Fernando Hiriart in charge of design of foundation; and Fernando Espinosa, in charge of construction. An average force of 120 men was employed on the building. Eleven months were required to complete the foundation.

The superstructure was erected by Pacific Bridge Co., an American firm with headquarters in San Francisco.

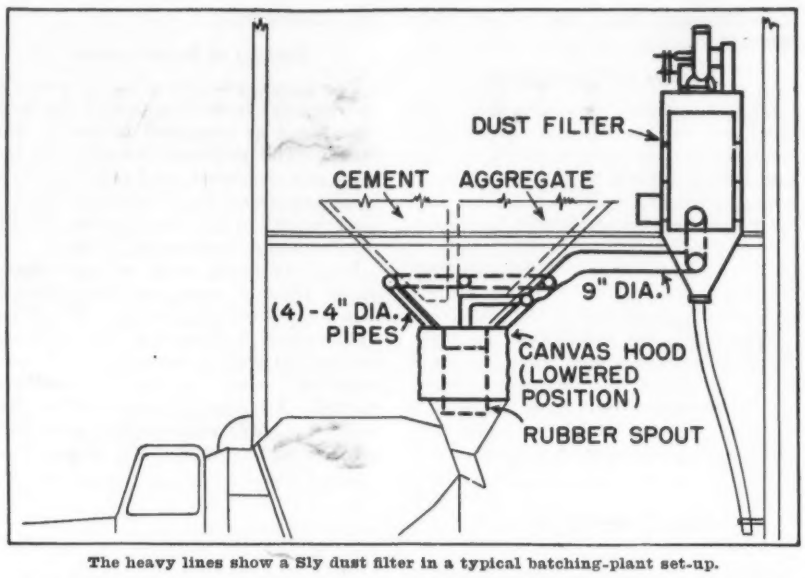
Reverse Air Process For Dust Collector

Three special features are claimed for the new dust filter made by the W. W. Sly Mfg. Co., 4700 Train Ave., Cleveland 2, Ohio: (1) no more shutting down to remove accumulated dust from bags; (2) longer bag life obtained by the elimination of shaking and flexing; and (3) no gradual loss of efficiency due to building up of a dust layer on cloth bags.

By frequent applications of blasts of reverse air, this new filter is designed to prevent the accumulation of dust on cloth bags. Created by the main fan of the dust-control system, these blasts require no auxiliary equipment. All shaking mechanism has been eliminated. The suction at the dust source remains uniform, and operation is continuous and automatic, according to the manufacturer.

Present installations of Sly dust filters can be changed over to embody the Sly Dynaclone features. There has been no alteration in the basic construction of the filter.

In addition to their application at asphalt and aggregate plants, these units are now being used to collect cement dust created when truck-mixers are loaded at batching plants. The installation of this equipment not only enables recovery of cement dust which would otherwise be chalked off as lost money, but also reduces labor time for keeping the truck-mixers clean, and results in improved public relations where dust clouds annoy people in adjacent areas.



The heavy lines show a Sly dust filter in a typical batching-plant set-up.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 82.

Mobile Truck-Mounted Hoisting Tower Described

A 4-page folder describing the Towermobile, a completely mobile truck-mounted hoisting tower, has been prepared by Mixermobile Manufacturers, 6855 N. E. Halsey St., Portland 16, Oreg. A center-fold spread of ten photographs illustrates Towermobile applications on various types of construction work. Brief comments describe the particular job being performed. The folder points out that the Towermobile is a truck-mounted steel tower, designed for one-man operation from within the truck cab by auxiliary power control. The elevating bucket is interchangeable with a 6 x 6-foot platform.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 18.

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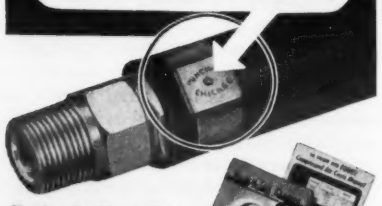

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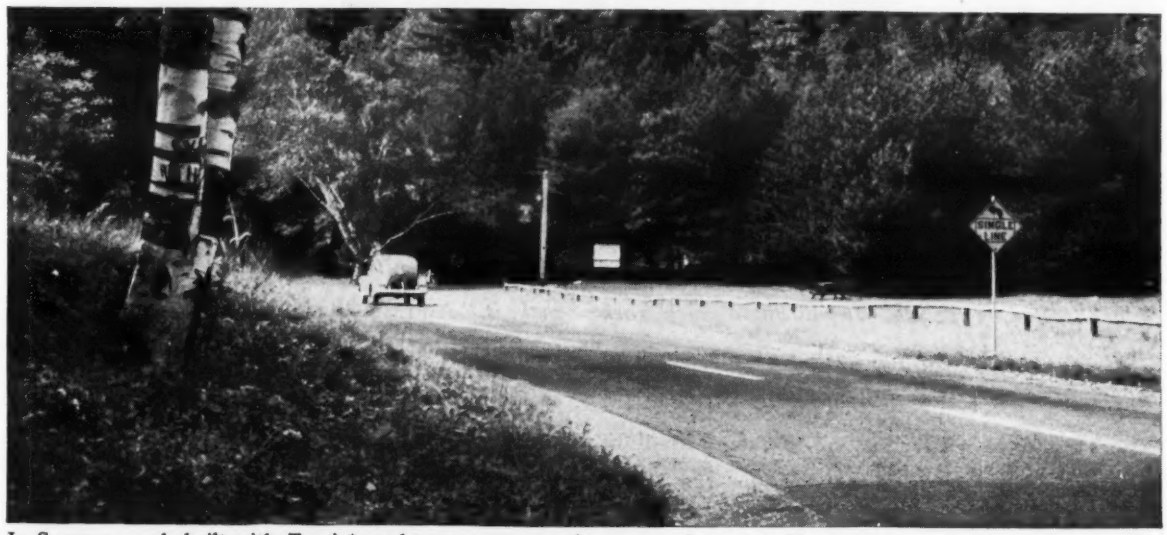

In Summer, roads built with Tarvia* road tar are easy on the eyes, and easy to ride on. Their smooth, non-glare surface blends with any landscape—takes the strain out of motoring.

In Winter, roads built with Tarvia* road tar are easier to keep clear because their granular, black surface absorbs heat and facilitates snow removal. Moreover, Tarvia* road tar is not affected by calcium chloride or sodium chloride.

Barrett's 46 years of experience in road building, maintenance and repair is yours for the asking. *Ask the Barrett field man.*

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Roads built with Tarvia* road tar have a slightly granular, "tractionized" surface which gives tires a better grip—even under unfavorable driving conditions.

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Concrete Widening Reclaims Old Slab

Subcontractor Puts 530 Feet Per Hour of 6-Foot Concrete Strip Along Old Highway

✦ A PORTABLE central mixing plant —in the form of a Koehring Twinbatch 34-E paver—reclaimed from obsolescence one of the important sections of interstate highway on the Minnesota transportation system. The 29.6-mile project between Sauk Rapids and Little Falls, on U. S. 10, demonstrated how 6-foot portland-cement concrete widening slab could be placed at the high rate of 530 feet per hour.

Sustained over a 10-hour run, the widening work proceeded at speeds often a mile per day or more. This was due chiefly to the unique scheme which combined the work of a standard paver with truck-mixers, to get the concrete out on the highway.

The prime contractor on the $778,000 Federal-Aid job was Megarry Bros. of St. Cloud, and the subcontractor who burned up the monthly report sheets with speed was Hallett Construction Co. of Crosby, Minn. The combined efforts of the two firms will see the total completion of a tough assignment by July 1, 1950, only 10 months after the work was started.

Includes Many Items

The project includes so many items that one engineer remarked, "This is a job to tie up every loose end that was ever left." It includes concrete base-course widening on all but 10 miles, grading, and a hot-mix asphaltic-concrete surface. This will be laid over the entire job when the widening is finished.

About 2 years ago, 10 miles of the section was graded and widened under another contract. Megarry's part of the actual work on this part of the contract includes only the covering of widened pavement with a 2½-inch minimum thickness of asphaltic concrete.

Megarry Bros. retained all contract items with the exception of concrete pavement widening and patching, and is doing this work in conjunction with the activities of Hallett Construction Co.

The job passes through three small towns: Royalton, Rice, and Sartell. In these villages there are some deviations from standard procedure, but in general about 80 per cent of the widening work consists of a 6-foot-wide slab of portland-cement concrete, 7 inches thick, placed along the north side of the existing 18-foot concrete slab. This old pavement dates back to about 1921.

Approximately 3 miles of the total length require the old pavement to be broken up and removed entirely. Men and equipment of Megarry Bros. did this work with a Northwest and a Bucyrus-Erie 22-B machine. The cranes were equipped with breaking balls. Two Gardner-Denver compressors with a few jackhammers, and an RPB Junior pavement breaker, also saw a great deal of service. The pavement was very tough, taking into consideration its broken-up condition, and the fact that it was not reinforced. Broken concrete was scooped to trucks by a front-end loader, and then hauled away to a dump area.

Grading Starts First

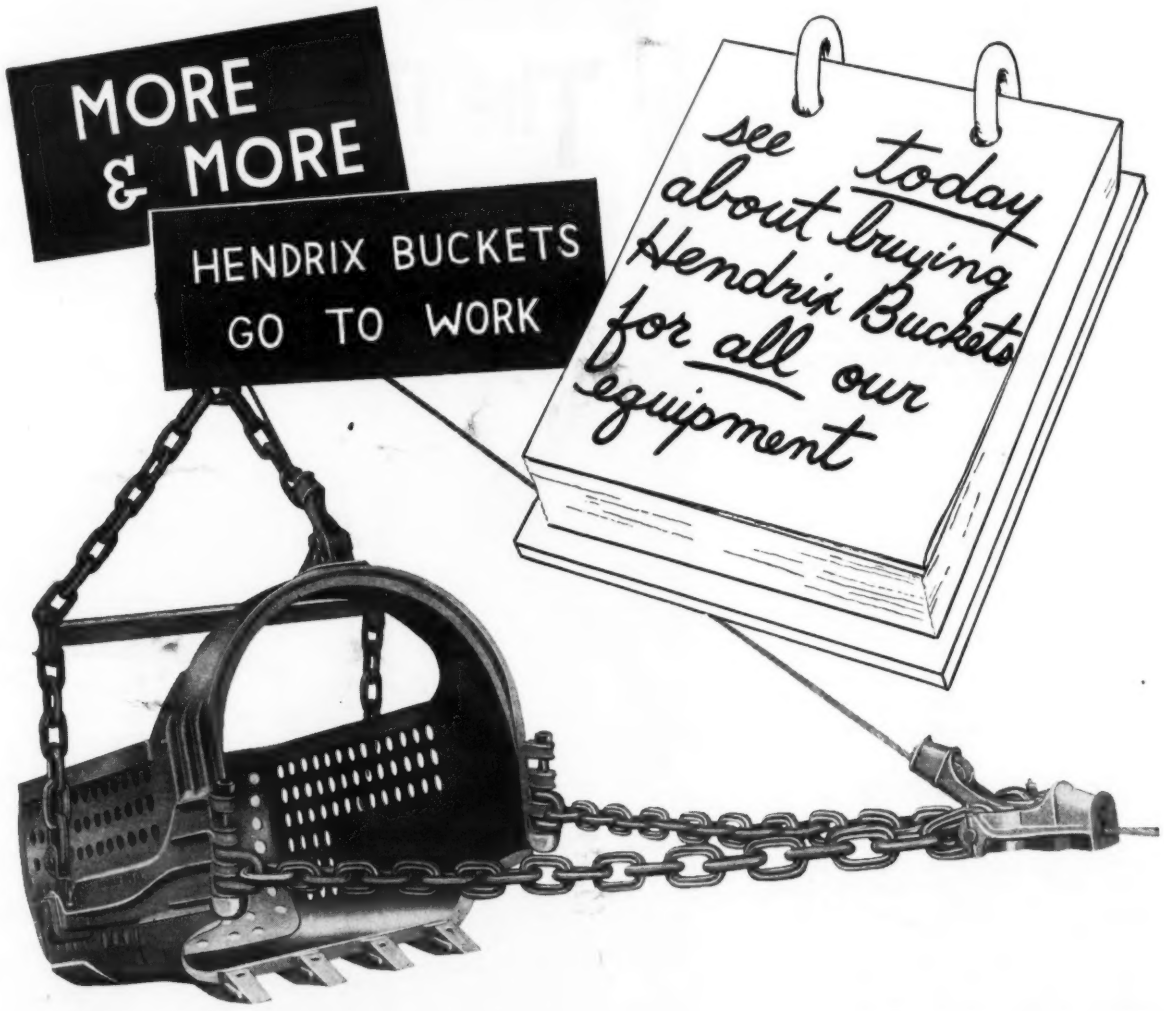
In an effort to establish grade far enough out ahead of Hallett's operations at all times, Megarry moved a fleet of tractor equipment in to handle the sand and clay grading. Altogether about 227,000 cubic yards of common excavation were involved, mostly under easy digging conditions and short hauls.

Five LeTourneau Carryalls were used: 2 Model W's, 2 LP's, and an LS. A D8 Caterpillar diesel tractor was the

(*Continued on next page*)

C. & E. M. Photo

The widening strip in place on the Sauk Rapids-Little Falls road in Minnesota. Flags kept traffic off the slab for 12 days.



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Concrete Widening Reclaims Old Slab

(*Continued from preceding page*)

prime mover ahead of these machines, and there was also a D8 push cat. Two sheepsfoot tamper units were handled by a D6 and an International TD-6, while spreading and leveling was handled by two Caterpillar No. 12 motor graders and a No. 11 machine.

The grading operation roughed in most of the earth work, leaving only the old shoulders generally in place. These were graded off as a part of the widening subcontract.

Pavement Widened Rapidly

Hallett used a new Galion 116 motor grader to blade off the shoulder earth in preparation for concrete. A trench about 8 feet wide was dug slightly high, to allow settlement for compaction. The excavated material was shoved out to one side, where Megarry's excavating and grading machines could pick it up and dispose of it in the fills.

A shallow form trench was excavated by using a 15-inch plow on the moldboard of the motor grader. This trench was referenced in from an offset line of stakes established by the survey party. Steel pins were then driven, a string line established, and the 10-foot sections of steel Metaforms were set up. A crew of 8 men managed to keep ahead of the widening operation, even if they had to set a mile of forms each day.

The subgrade consisted of sandy material, which was easy to shape and dig. As fast as the crew could set the forms, one man with a Cleveland form tamper moved along and tamped the sand under the base. While state specifications on the widening were not too fussy, a standard of workmanship was maintained in setting the forms which came very close to matching first-quality construction practices on new work.

The subgrade was prepared after the forms were set by using a small 6-foot shop-built drag planer behind a motor grader. The excess earth it picked up was scooped outside the forms from time to time, and the subgrade was compacted by rolling it with a Galion 5-ton tandem roller.

With traffic on the highway, it was necessary to protect the operation by stationing flagmen at each end of the operation.

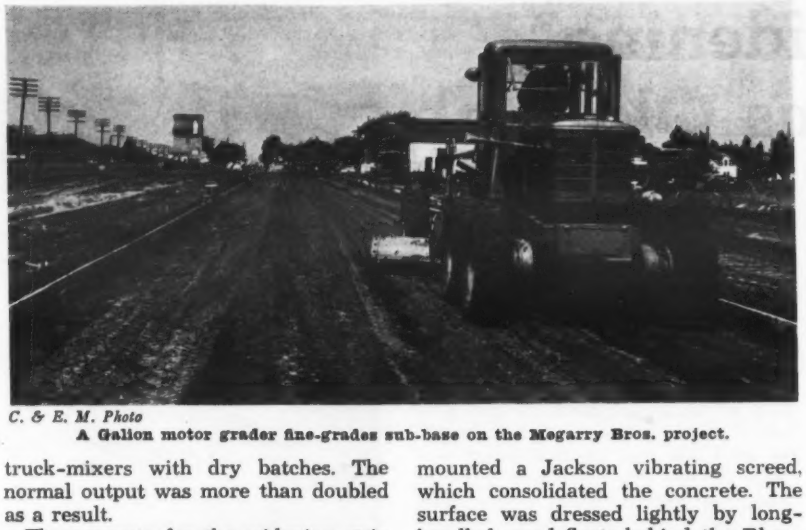
Unique Widening Set-Up

Reasoning that placing depended primarily on getting a great deal of concrete out to the highway in the shortest possible time, Superintendent Q. J. Meeuwsen of the Hallett organization decided against using his four Jaeger Dual-Mix truck-mixers direct between the batch plant and the concrete pour. Instead, he tried a unique stunt.

Taking his Koehring 34-E Twinbatch highway paver, he erected high earth ramps at intervals of about 2 miles, and spotted the paver on this ramp. A fleet of batch trucks then hauled dry batch material from the batch plant, which also shifted between three locations. The dry-batched material was fed into the paver and mixed with water hauled out and stored in a transfer tank, and after a 1-minute mix it was transferred by the big Twinbatch paver to the truck-mixers.

Each of the 4 truck-mixers received 3 batches, of the standard 38-cubic-foot size. The truck-mixers then hauled the material to the pouring point, meanwhile acting as agitators. The truck-mixers were able to travel on the old pavement all the way, with the help of the flagmen. The loads were dumped as rapidly as possible.

Meeuwsen contends that it took no more time to run the dry batches through the high-capacity Koehring paver than it would have to charge the truck-mixers with dry batches. The normal output was more than doubled as a result.



C. & E. M. Photo

A Galion motor grader fine-grades sub-base on the Megarry Bros. project.

The concrete for the widening strip was handled and spread by only one machine: a Blaw-Knox 6-foot road finisher. On the front end of this rig was mounted a Jackson vibrating screed, which consolidated the concrete. The surface was dressed lightly by long-handled wood floats behind the Blaw-Knox machine, and a light burlap drag was applied longitudinally with the road.

The fresh concrete received a curing application of emulsion, followed by whitewash. After 24 hours the forms were moved ahead. This was done by pulling the form pins from the sand and loading the steel form sections on a flat-bed truck. Traffic was not permitted to use the fresh concrete strip for 12 days, and all during this time the material had to be protected by red flags during the day and flares by night. At one time there were close to 6 miles of flags out.

No special provision was made about bonding the concrete to the edge of the old pavement, and no joints were made. The few construction joints at the end of a day's run consisted of a wooden header, with a few ¾-inch steel dowel bars.

Full-Width Pavement Placed

In the 3-mile total where the old pavement had to be removed due to its bad condition, the material was replaced by full-width construction 24

(*Continued on next page*)

The Tiger Brand Specialist says-

C. & E. M. Photos

The Lima clamshell at left is serving the batch plant on the Megarry Bros. road-widening job. Above, a Koehring 34-E Twinbatch paver and a Jaeger-Lakewood finisher put in 24-foot full-width paving near Rice, Minn.

feet wide and 6 inches thick. This construction was not in one continuous run by any means, and as a matter of fact, the longest section was only 3,200 feet in length.

This pavement was also placed by standard methods, with the possible exception that the absence of elaborate joint and finishing requirements made it an unusual pleasure for the concrete-paving crew.

The steel Metaforms were handled in the same manner as for the widening, except of course that the full-width pavement required the use of forms on both sides of the slab. A drag-planer behind the Galion motor grader did the fine-grading, and the Galion steel-wheeled roller did the compaction.

The Twinbatch paver was spotted between the forms for full-width work, and dry-batch trucks entered on the subgrade through occasional blanks left in the forms. The batches were very carefully spotted on the subgrade by the paver operator, for the only other machine to handle the concrete consisted of a Jaeger-Lakewood Type H finisher.

A gang of about 8 men worked ahead of and behind the finishing machine, helping to spread out the concrete and moving excess material ahead. With a little practice, however, the paver operator became expert in spreading just the right amount of concrete.

Two concrete finishers worked behind the Jaeger machine finishing off the top of the slab with long-handled floats. The slab edge at the forms was consolidated by two large electric vibrators carried on a frame just ahead of the finishing machine.

The same curing methods were employed on the full-width paving as for the widening work, and traffic was handled around these sections by short oiled detours made by Megarry's grading equipment.

Batch Plant Portable

A batch plant was used which was about as portable as anything on the project. It moved three times during the work without causing more than a few days' delay either time.

Bulk cement for the mix was handled at the near-by railroad by a Johnson Dutch Mill, which had a screw feed unloader at track level. Trucks hauled the cement over to the paver, with the sand and aggregates which were added at the batching plant.

The batcher was also a Johnson manual rig, which was set up between two huge stockpiles of sand and rock aggregate. A Lima crawler crane with a 50-foot boom and a 1-yard clamshell bucket kept the bins charged, and the stockpiles in turn were served by trucks from the aggregate production plant.

Aggregate Produced Locally

The sand and aggregate for the mix was produced locally at one pit, near Royalton, by men and equipment of Hallett's organization. This too was an all-portable plant, consisting of a primary plant fed by a dragline, connected by a conveyor belt to a secondary screening unit.

A Manitowoc 2000 dragline, with a 1½-cubic-yard bucket, dug pit-run material out of the Mississippi River bank. Two 50-foot field hoppers charged the plant; they could be moved so easily that it was always possible to feed the plant by dragline, operating the machine practically at its peak performance.

The primary rock plant consisted of a Diamond 10 x 30 jaw, with 18 x 30 roll crushers. This plant also had a 3 x 10 double-deck vibrating screen, and for this job was breaking on the ⅜-inch mesh. In other words, material smaller than ⅜ inch was classified as sand, while material from ⅜ to 2 inches was classified as large aggregate. No sand washer was employed, and the rock production phase was all "dry".

One hundred feet of 24-inch conveyor belt carried the broken rock from the primary plant to the secondary sizing unit, where final screening was done. This plant consisted of a double 4 x 10-foot deck Simplicity vibrating screen.

(*Concluded on next page*)

"Here's what you should know about wire rope —and how to select, use and care for it."

THE three most important qualities that wire rope must possess are (1) strength, (2) fatigue resistance, and (3) abrasion resistance. Whether the rope is used on hoists, cranes, excavators, conveyors, loaders or unloaders, these properties are required in varying degrees depending on serivce requirements.

STRENGTH—This is determined by size, grade, and construction. Wire for wire rope can be made in any desired tensile strength ranging from iron grade at approximately 100,000 lbs. per sq. in. to improved plow steel grade at approximately 250,000 lbs. per sq. in. The knack of making Tiger Brand Ropes with uniform strength throughout shows the skill of the wire rope manufacturer.

FATIGUE RESISTANCE—The ability to make wire that will stand thousands of bends over drums and sheaves without breaking is no small accomplishment. The wire must be made with just the right amount of toughness and ductility. Tiger Brand Wire Rope is made from wire especially fabricated for wire rope use. Ropes composed of a large number of small wires will have higher fatigue resistance than those made with a smaller number of large wires.

ABRASION RESISTANCE—This is determined by the size and chemistry of the wires, especially the outer wires as they are exposed to the most wear. Obviously, the larger the wire size the greater the resistance to abrasion. Furthermore, the high strength steels are better able to withstand wear because of a greater carbon content. This means that improved plow steel ropes would have the highest abrasion resistance.

Getting the right balance

Individually, the properties of strength, fatigue resistance, and abrasion resistance are not difficult to obtain . . . but in wire rope making, it is impossible to accent one property without detriment to the other two. That's why the skill and experience of the men who make Tiger Brand Wire Rope are so important. Satisfactory performance demands that running ropes possess all three properties and therefore it is necessary to obtain an effective balance which meets the requirements of your particular job.

How to get longer wire rope life

Don't overload the rope.

Don't subject the rope to sudden impact loads.

Don't use undersize sheaves and drums—this is the commonest cause of fatigue breaks.

If vibration is present, make regular cuts from the end of the rope so as to change the dampened section.

Keep groove diameters proper size so as to avoid pinching of rope.

Avoid flange wear as a result of bad sheave alignment.

If grooves become fluted, it is usually a sign that the sheaves should be replaced with a harder material.

Lubricate regularly. Wire rope is a machine and requires adequate lubrication. It must also be protected from corrosion to retain strength.

Avoid kinking, improperly attached fittings, and uneven drum winding.

Make use of the Tiger Brand Wire Rope Specialist

It is very much to your advantage and to ours to maintain good operating practices. Call in the Tiger Brand Specialist at regular intervals and have him give you a FREE Check-up. He is thoroughly experienced in proper wire rope application.

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AMERICAN TIGER BRAND WIRE ROPE

Excellay Preformed

UNITED STATES STEEL

Concrete Widening Reclaims Old Slab

(Continued from preceding page)

Under the screens were two 20-yard hoppers, which stored the material temporarily until the trucks could haul it away.

All trucking, including aggregate hauling and batch work, was subbed to the Earl Partanen Trucking Co. of Bovey, Minn. Partanen used his regular fleet of Fords, augmented by such rented trucks as he needed to do the work. From 10 to 18 trucks were needed to haul sand and aggregate, while about 8 batch trucks were usually the rule.

Approximately 3,700 tons of mixture was placed on 14 miles of this project during 1949. It was placed in a 1-inch minimum binder course, topped out by a 1½-inch wearing course.

Serious as the traffic problem was, the widening and other dangerous work had been about 75 per cent finished without a single accident when the project was visited.

Another severe problem—a railroad culvert which passed Mississippi River water into one of the highway fills—was solved by enclosing the embankment from the culvert with an Armco metal wall. So far as could be determined, it did not leak after being installed.

Personnel

The project is being done for the Minnesota Department of Highways under the general supervision of O. L. Kipp, Chief Engineer, with C. L. Methen as Construction Engineer and B. A. Johnson as Project Engineer.

For Hallett Construction Co., Q. J. Meeuwsen was General Superintendent, Lloyd Thompson was Concrete Foreman, Sidney Dies was in charge of fine-grading, and George Hokanson was in charge of the batch plant. Jim Hill was the General Superintendent for Megarry Brothers.

New 4-Yard Shovel

A new 4-cubic-yard excavator, the Marion Type 111-M Ward-Leonard electric shovel, has recently been introduced by Marion Power Shovel Co., of Marion, Ohio. Designed for use where big yardages and continuous service are important, the new Marion has a 3½ to 4-yard shovel capacity and a 2 to 4-yard dragline capacity. Boom lengths are 33 feet and 80 to 100 feet.

It is a fast-working machine, says Marion, because of the cushioning protection of the electrical controls against a mechanical overload. The Ward-Leonard control governs all motions. Generators are so designed that the current of each motor is limited to a value which will develop maximum torque required. Other features include: welded construction of deep sections on the upper and lower frame, heat-treated machine-cut gears, alloy-steel shafts, forged crawler rollers with bearings shielded from dirt, and extra-large hook rollers. Marion points out that the operator can drop the stiffleg gantry to cab height by lowering the boom, yet maintain a high gantry in operation to form a wider boom support angle for stress reduction.

Standard crawler length is 16 feet, but a 20-foot crawler may be obtained for dragline work. Standard crawler belt width is 36 inches, and a 44-inch width may be obtained. Bearing areas are 83 and 101 square feet respectively; and 129 square feet for the long, wide crawlers.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 127.

Marion's new Type 111-M Ward-Leonard electric shovel has a 3½ to 4-yard shovel capacity and a 2 to 4-yard dragline capacity.

THE "Quinn Standard" FOR CONCRETE PIPE

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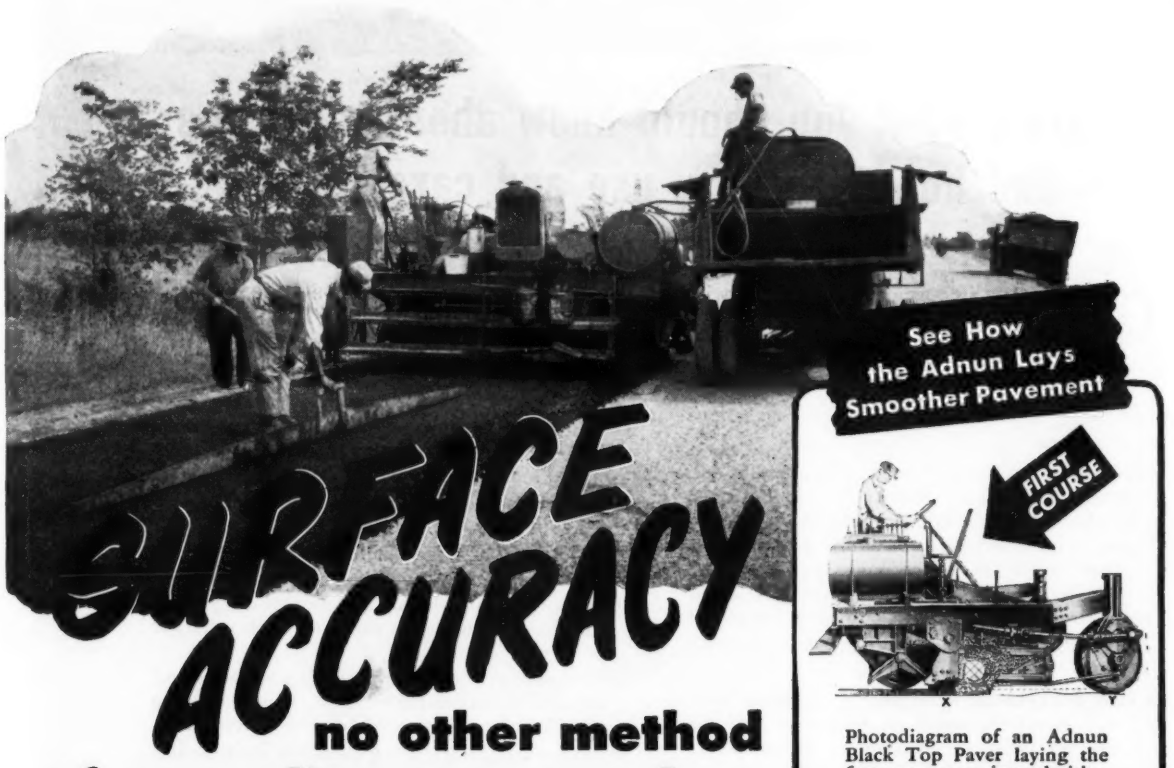

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Continuous Course Correction — the automatic feature of the Adnun that corrects the irregularities in successive courses of black top pavement is an exclusive Adnun feature.

With the rollers riding on the finished surface and the Cutter Bar set close to the rollers, finished surfaces of unusual smoothness can be laid even with a very rough base and the minimum of advanced preparation.

The danger of "tearing" is reduced by the oscillating, sawing, cutting action of the Cutter Bar and an initial compression results from the bevel design of the tooth. This combined with the Breaker Bar action permits laying the heavier, tougher, cold mixes other pavers find difficult. Full adjustment permits "feathering" edges for widening on crowned surfaces and laying narrow strips. These advantages mean time and money. Don't plan a Black Top Contract without investigating the Adnun.

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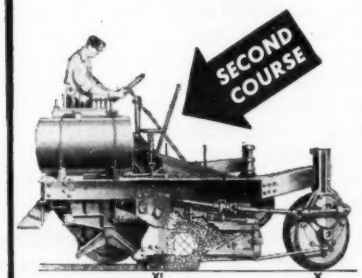
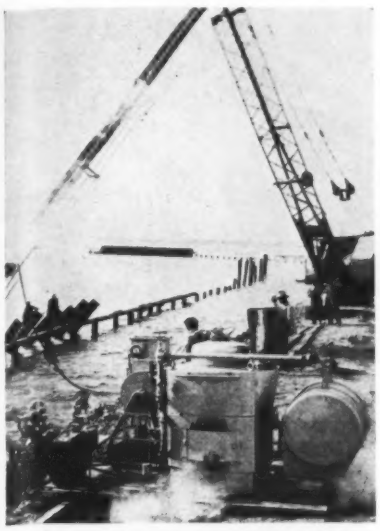
See How the Adnun Lays Smoother Pavement

Photodiagram of an Adnun Black Top Paver laying the first course over irregularities. For the purposes of illustration, the front wheel has been dropped into a hole the unusual depth of 5 inches. Even a hole this deep causes a deflection at the Cutter Bar (X) of only 3/4 of an inch.



Photodiagram of the second or top course. Here the front wheel of the Adnun has arrived at (X) a drop of 3/4 of an inch. The 3/4 inch hollow will be smoothed completely and an imperceptible ripple of 3/16 of an inch will be left at (X1) in the finished course.

Are you pouring concrete? Ask for a copy of the Booklet, "How Would You Do These Jobs?", on the MultiFoote HighLift Boom.



The Kwik-Steam vapor generator is designed to produce steam in 2 minutes from a cold start. Shown here powering a pile driver, it can also be used with steam hoists, asphalt plants and tank cars, steam cleaners, etc.

Steam Power or Heat For Varied Job Needs

A completely packaged steam-generating unit in sizes producing from 500 to 4,000 pounds of steam per hour has been developed by Littleford Bros., Inc., 457 E. Pearl St., Cincinnati 2, Ohio. The Kwik-Steam vapor generators are designed for a variety of construction jobs: pile driving, aggregate and asphalt heating, steam hoisting, job heating or concrete curing, and steam cleaning.

The generators are said to produce steam in 2 minutes from a cold start. Automatically controlled, the Kwik-Steam burner cycles off when steam is not needed and on again when it is needed. After starting, automatic controls take over to keep a predetermined pressure at all times. Operating pressures can be regulated between 75 and 300 psi. Safety controls include an unloading valve which by-passes water and fuel when the steam reaches the desired pressure, a fuel control which cuts out the burner in case of lack of water, and a steam temperature control.

The unit consists of a continuous-coil type of generator, controls, power source, and a steam chest (optional) for pile-driving work. A variety of air-cooled gasoline engines or 220/440-volt 3-phase 60-cycle electric motors are available as power sources. An electric eye for unattended operation may be obtained with the electric motors when desired.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 104.

Scalper Built to "Take It"

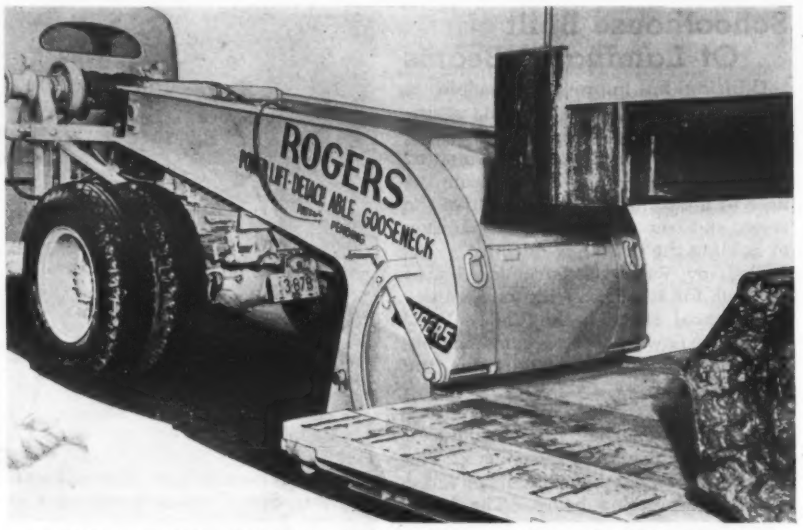
A new 4-page bulletin on the Hewitt-Robins heavy-duty scalper has been issued by the Robins Conveyors Division, Hewitt-Robins, Inc., 270 Passaic Ave., Passaic, N. J. It describes and illustrates a machine built to scalp off lumps of solid rock as big as 5 x 5 x 5 feet and weighing 1½ tons or more per piece. According to the catalog, the scalper absorbs the weight of impact so that no vibration is felt in its base or imparted to supporting structures.

This literature may be obtained by requesting Bulletin No. 131, or by using the Request Card at page 16. Circle No. 65.

Deck Lifts, Lowers On Gooseneck Trailer

A new design development for low-bed trailers has recently been announced by Rogers Bros. Corp., of Albion, Pa. The new Rogers Power Lift detachable-gooseneck trailer is designed to facilitate rapid loading and unloading. Moreover, the trailer deck can be lowered to clear overhead obstructions, and raised to clear railroad embankments and other roadbed obstructions which would normally make it necessary to detour the trailer with its load or unload and reload it.

Deck raising and lowering is accomplished quickly by means of a cable-operated ram driven by the tractor winch. The company states that the new design is available on most Rogers trailers from 15-ton capacity up, and can be adapted to many now in use.



A detachable gooseneck and a deck which can be raised and lowered—these are features of the new Rogers trailer.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 151.

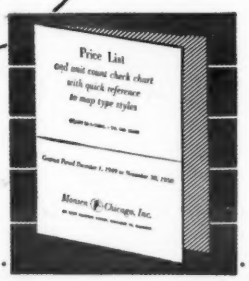
Send for this "Quick Reference to Map Type Styles" today and see how Monsen Trans-Adhesive map type can help you cut the cost of map-making, and, at the same time get better looking maps.

Because Trans-Adhesive map type comes to you on patented* and exclusive transparent impressions, you can *see* where to place the names of cities, countries, mountains, rivers, oceans, etc. And you can remove Trans-Adhesive map type without damage to the original drawing—a great aid to city, county and state road departments who change maps frequently.

The adhesive makes every name stick permanently to any dry surface without rubber cement, paste or a wetting agent. Printed on the underside, it is possible to rub each patch down thoroughly without marring the type.

You can solve your map-making bottlenecks by using Monsen Trans-Adhesive map type impressions.

*Crowder Patents U. S. Pat. Off. Nos. 1820867 and 1963778, and Can. Pat. Off. No. 343495.



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A complete line for every type of Rock Drill, Pavement Breaker and Clay Digger.

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Schoolhouse Built Of Laminated Beams

Utilizing an improved principle as applied to school construction, a six-classroom building at East Whittier, Calif., is built around glued, laminated bents or beams. They extend from the floor to the ceiling, across the top of the room, and back to the floor, in addition to holding the overhang outside.

Built by Valley Construction Co. of Fontana for the East Whittier Elementary School District, the Valley View School is now in use, accommodating the elementary-grade children in the area.

The beams, which were manufactured by Summerbell Roof Structures, are exposed inside the classrooms. The classrooms have angled ceilings faced with soundproofing board. The laminated beams extend outside to hold the roof, covering open-air passageways between classrooms, thus eliminating the usual dangerous pipe columns.

This type of one-unit beam construction puts the building into the heavy-beam-structure classification, the builders explain. The beams for Valley View School are 5¼ inches thick and from 20 to 40 feet in width, depending upon the size of the room. They extend up about 20 feet.

With practically everything prefabricated and trucked in, in addition to the prefabbed beams, a saving of about 30 per cent in construction time was made, and about 10 per cent of the design cost was saved.

The laminated beam system has been used successfully for several years in grocery stores, theaters, and so on, but this is said to be one of the first times it was tried in a school.

It not only allows trilateral lighting and cross ventilation, but is also flexible because partitions can be moved to meet different requirements of other grade levels without weakening the structure. The building is from 2½ to 5 times as strong as the minimum state requirements set up in the Fields Bill, according to school officials.

C. & E. M. Photos

The Valley View School at East Whittier, Calif., was built with laminated beams. Above is a view of the completed building. At right, Dan Hoak, Superintendent for Valley Construction Co., points out the beams.

Preservation of Timber

Wherever timber is used for structures, it must be prepared to withstand the attacks of decay and wood-destroying insects. Though some species are more resistant than others, millions of dollars are lost annually through the deterioration of timber structures. That this is the case in almost every timber installation, in all types of industries, is graphically shown in a booklet recently prepared by The Dow Chemical Co., Midland, Mich. The booklet points out that this widespread loss is not inevitable, but can be reduced by the installation with treated timber.

Dow pentachlorophenol, the literature explains, is a wood preservative toxic to both wood-destroying fungi and insects. A series of photographs show the type of destruction one can expect from untreated timbers, and the protection one can obtain on the same installation with treated timber.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 103.

Roebling's Names Huber

Walter A. Huber is now General Manager of the Wire Rope Division of John A. Roebling's Sons Co., Trenton, N. J. His appointment is part of a plan to specialize the company's product divisions.

Pa. Tells Road Story on Film

Just for the asking, Pennsylvanians can get a visual slant on their Highway Department's problems and plans. Business and civic organizations, clubs, churches, and other groups can secure without charge from each district office of the Department a new 16-mm sound and color film called "Pennsylvania's Highway Story"—plus a projector and operator for the showing.

The film pictures actual highway conditions under today's heavy flow of traffic. It contrasts modern highways with roads built in earlier years. And through animated drawings, it shows where the highway dollar comes from and how it is spent.

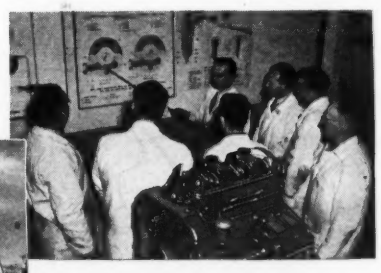
This is the second film the Department and the Pennsylvania State College Motion Picture and Recording Studio have made. The first was called "Construction Ahead" and shows road building in all its phases from design to completion.

Wherever you are you're not far from

...GM DIESEL

OWNERS of General Motors Diesel engines and GM Diesel-powered equipment know they can depend upon receiving courteous service *after* as well as *before* the sale. They know that, wherever they are, a GM Series 71 Diesel Distributor or Dealer is ready to answer call for a quick tune-up, a repair or a Factory-Engineered GM Diesel part. Staffs of factory-trained service men have the tools, the know-how and a thorough, capable interest in seeing that every engine delivers its best. Here, for your convenience, is a list of GM Diesel Industrial Distributors and Dealers in strategic locations throughout the United States.

Service Backed by Training



IN THE FIELD—Completely equipped Mobile Training Units, currently touring the country, bring specialized instruction in the proper operation and maintenance of GM Diesel engines to contractors' personnel. Itinerary of the units includes scheduled visits to major construction and mining projects as well as stops at GM Distributor points where groups of smaller contractors' personnel meet for 2 or 3 day courses.

AT THE FACTORY—GM Distributor and Dealer service men, as well as customer personnel, take courses in the maintenance and repair of GM Series 71 Diesel engines at the Detroit Diesel Engine Division Factory Service School. Classes of 12 students are scheduled every two weeks. Enrollment is limited so that each participant may be assured of personalized instruction, with emphasis on actual shop procedures.

Diesel Brawn Without the Bulk

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DIESEL POWER

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ARMSTRONG EQUIPMENT CO.
Montgomery
ALABAMA MACHINERY & SUPPLY CO.

ALASKA—(Seattle, Wash.)
Anchorage, Fairbanks
YUKON EQUIPMENT, INC.

ARIZONA—Phoenix
STATE TRACTOR & EQUIPMENT CO.

ARKANSAS—Stuttgart
EDDINS SERVICE
Little Rock
LEWIS DIESEL ENGINE CO.
Morrilton, LOVE SUPPLY CO.
Fort Smith
R. A. YOUNG & SON, INC.

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ANDERSON-O'BRIEN CO.
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Stockton, Fresno
MOORE EQUIPMENT CO., INC.
Berkeley, Ft. Bragg, Eureka, N. Sacramento
WEST COAST ENGINE & EQUIPMENT CO.
Bakersfield
FARM IMPLEMENT & ENGINE CO.
Corcoran, FARMERS MACHINERY CO.
Visalia
TULARE COUNTY TRACTOR CO.

COLORADO—Denver
THE COLORADO BUILDERS' SUPPLY CO. (Equipment Div.)

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BLALOCK MACHINERY & EQUIPMENT CO.
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TRACTORS & EQUIPMENT, INC.
Savannah, MORGAN'S, INC.
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ROME FARM EQUIPMENT CO.

A 2½-Yard Shovel, Dragline, and Crane

The Lima Type 1002, designed and built by The Lima Shovel & Crane Division, Lima-Hamilton Corp., Lima, Ohio, for shovel, dragline, clamshell, and crane service, is equipped with Precision aircontrol. Air is utilized for all operations except the truck lock and hoist brakes.

The shovel boom is of welded box construction, with a flared base to prevent side sway. It comes in two lengths: one 28 feet long with a 21-foot handle for standard operation, one with a 45-foot boom and a 32-foot handle for high-lift operation. The dippers are 2½ cubic yards for the standard and 2 cubic yards for the high lift. The shovel has a chain crowd.

The basic dragline, clamshell, and crane booms can be lengthened by adding inserts of various lengths. These are butt-connected by alloy-steel bolts. The booms are lattice type and all-welded construction. Dragline capacities vary, depending on the length of the boom and the nature of the work. Mast assemblies are available for various lengths of booms. The capacity of the machine as a crane is 60 tons at a 12-foot radius.

The Lima Type 1002 shovel, equipped with a 28-foot boom, 21-foot dipper handle, and a 2½-cubic-yard Amsco dipper, is shown operating in a quarry.

Two 6-cylinder diesel power plants are available for this machine. The engine clutch is a friction disk unit, with engagement controlled by air. A roller chain transmits power from the engine to the operating machinery. The boom hoist is worm-driven and is self-locking in operation. The boom is both raised and lowered by power.

The crawler truck is of the side-frame type with small dolly rollers which support both the loaded and unloaded sections of the crawler belt. Each roller is equipped with a piston-ring type of dirt seal. The crawler is of the end-drive type and each crawler belt is propelled by a roller chain housed under the belt to keep it clean. The truck base is a steel casting with the pintle, side-frame connections, roller paths, and upper gear case cast integrally. The truck is completely bronze-bushed.

Further information may be secured from the company by requesting Bulletin No. 102. Or use the Request Card at page 16. Circle No. 102.

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Contract Bonds

The nature and functions of the construction-contract bond, and the advantages accruing from the bonded contract to the owner, architect and engineer, contractor, subcontractor, and supplier, are discussed in a booklet just published by The Surety Association of America, 60 John St., New York 7, N. Y.

Titled "Construction — The Bonded Contract Is the Owner's Protection", the booklet stresses the assurance of fulfillment of the contract and the guarantee of payment for labor and material when performance and payment bonds are written for a construction project.

The foreword was prepared by Edward H. Cushman, noted Philadelphia attorney, who has specialized in problems of the construction industry for over thirty years. He is the author of "The Law of Mechanics' Liens in Pennsylvania", "Bonds on Public Improvements", and many law-review articles.

Mr. Cushman comments in part: "In an economy which has become increasingly complex, the corporate surety bond has assumed great importance by the substantial elimination of risk, thus making it a bulwark of support to American industry and finance. This is particularly true in building construction where such bonds protect all parties in interest and furnish to the private owner or public body, as well as the suppliers of labor and material, added assurance of successful performance and full payment of just claims."

This literature may be obtained without charge from the Surety Association, or by using the Request Card at page 16. Circle No. 108.

Sectional Steel Scaffolds

How to put workers safely at job level, is the subject of a new 4-page bulletin, No. PSS-14, on Trouble-Saver sectional steel rolling scaffolds. Issued by the Patent Scaffolding Co., 3821 12th St., Long Island City 1, N. Y., it describes and illustrates a variety of arrangements of prefabricated steel sections in use as movable scaffolds for repairing, painting, plastering, and other maintenance work. Typical installations are shown, together with methods for assembling sectional units to adapt scaffolding to space, height, and shape requirements of different jobs. Text covers erection advantages and safety features.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 79.

N. J. Highway Appointment

Edward W. Kilpatrick of Hackettstown has been appointed New Jersey State Highway Engineer. He succeeds Charles M. Noble who resigned to become Chief Engineer of the New Jersey Turnpike Authority.

On a Wunderlich-Griffis contract in Mississippi, a Buckeye 51 ditcher powered by a Caterpillar diesel D13000 engine (left) and a Koehring clamshell powered by a D318 (center) dig trench for pipe-line construction. At right, a Caterpillar D8 and other Caterpillar tractors equipped with Trackson side booms lay the gas pipe.

Marshy Soil Fails To Slow Pipe Laying

Wunderlich-Griffis Construction Co. of Tulsa, Okla., recently laid 112 miles of pipe line for Transcontinental Gas Transmission Co. The full length of the gas line will extend from Eunice, La., to New York, and is scheduled for completion by September, 1950. This particular section began 2½ miles east of Bassfield, Miss., and ended at the Tombigbee River in Alabama. The terrain was hilly in some places and in others was rugged, stumpy, log-infested swampland where the ground was soft and mucky and the ditches filled with water. Although Clyde W. Broome, spread superintendent, considered the land the worst he had ever seen for pipe-line work, the company succeeded in laying over 1¼ miles of 30-inch steel pipe per day. The outfit worked a 10-hour day.

The contractor used four Caterpillar diesel D8 tractors and one D7 equipped with bulldozers to clear and backfill. Seven D8's and two D7's with Trackson side booms were used for stringing, stabbing, and laying-in the 30-inch pipe. Two Buckeye 51 ditchers powered by Caterpillar diesel D13000 engines were assisted by three Koehring clamshells with D318 engines in cutting and digging the trench for the pipe line.

Unit for Preheating And Stress Relieving

A combination unit for heating before welding and stress-relieving after welding, the new 40-kva Model RTA regulating unit and 40-kva Model AC3 low-frequency induction heating unit, has been announced by Electric Arc, Inc., 152-162 Jelliff Ave., Newark 8, N. J. The RTA regulating unit is arranged for operation on 220, 440, and 550 volts at commercial frequencies. The AC3 heating unit is small enough to be placed near the work with easy accessibility.

With Models RTA and AC3, more equipment can be added as required, and when larger jobs are contemplated, the Model AC3 can also be used as a booster unit with other Smith-Dolan heating equipment. Automatic control cabinets, also made by Electric Arc, Inc., can be used with Model RTA.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 74.

Steam Boiler Plants

A 12-page catalog which points out the features of self-contained oil and gas-fired steam boilers for processing and heating has recently been prepared by the Cleaver-Brooks Co., 326A E. Keefe Ave., Milwaukee, Wis. The attractive 12-page 4-color catalog is available to all users of steam boilers. It illustrates various sizes of steam boilers ranging from 15 to 500 hp and 15 to 200 psi. A diagrammatic cross-section illustration, representative of the four-pass design found in Cleaver-Brooks boilers, is included in the catalog. Oil-fired, gas-fired, and combination oil and gas-fired boilers are shown.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 97.

McGraw Personnel Changes

Two officers of F. H. McGraw & Co., international engineering and construction firm, have been elected to the Board of Directors of that company. They are Frederick J. Mayo of New York and Donald W. Neville of Chicago. Both men are Vice Presidents of the company, and they head McGraw's New York and Chicago offices respectively.

George R. Best has been made the manager of the firm's Pittsburgh office. Ted Page will assist him. The company's engineering department has been transferred to Hartford, and the Pittsburgh office is now an operational office.

Heil Representative Dies

Harry C. Tecklenberg, sales representative with Heil Chicago, died recently of a heart attack. He was a sales representative for The Heil Co. from 1935 to 1945, when the Heil branch in Chicago became a distributorship.

Get MORE JACKING POWER
LONGER JACK LIFE
A User Says:
"47,000 lifting cycles in 18 months operation under 340° temperature"
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Put a Simplex Hydraulic to work on your tough jacking jobs to save time and manpower. Available in eight models with capacities from 3 to 100 tons — safety-tested to 50% over rated capacity.

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By RAYMOND P. DAY,
Western Editor

✦ "THE best highway maintenance is the simple act of fixing a road before it gets too bad. That takes work.

"The poorest highway maintenance is the sign which reads 'Rough Road Ahead'. It takes a lot of gall to put up a sign like that. We don't have any in this district!"

Wise words, these. They come from a tall, wiry man with gray in his hair and the marks of the desert on his face. Those words carry a lot of weight, because for 26 years Robert E. "Bob" Baker has been fighting snow, potholes, and asphalt. As a maintenance man for the Nevada Department of Highways, he has seen much. Except for short sojourns with contractors, and a leave of absence during the war, Baker has done everything from truck driving to general maintenance supervision at district level, in his long battle with the things which cause highways to go bad.

"Everybody wants to work maintenance by formula," Baker said in his slow, mild way. "One book will tell you to use a gallon of asphalt. Another will call for a gallon and a half. Some expert will come along and he'll guess something else. You'd better use what the material requires. Nothing will take the place of field experience when you start figuring what that amount is."

Baker is not the kind of man to boast about his long experience, nor does he claim to know everything. But his calm, competent manner shows how much he has been around, and the highways he maintains also reflect it. Last summer when he asked an engineer's permission to watch some sealing work in another division, the man said, "Hell, Bob, we'd better come up and watch you. You're already doing twice as much as we are."

"Start Where the Trouble Is"

"Highway maintenance is one headache after another," Baker says. "You've got to like those headaches, and the hard work that goes with them, if you want to be a real maintenance engineer.

"You've got to learn something about values. You can't simply go out and work on road surfaces, because a lot of the time the trouble is in the subgrade. Yet many maintenance engineers do scarcely anything but armorcoat work. Drainage is just as important as it ever was—even in a dry climate like this.

"You've got to learn that many an operator doesn't give a damn about whether you pulverize all the old oil cake. His time is going on just the same. It's up to the maintenance man in charge to follow through on those details, no matter how well you've got the job organized.

"You've got to learn to anticipate trouble before it starts, and to attack the trouble with maintenance measures which go to the root of your problem. Maybe some maintenance men do mostly one kind of work, but if they're good maintenance men they'll be doing a variety of jobs."

Baker practices what he preaches. In a short 15-mile sector near Austin, where a crew was repairing U. S. 50, he had oil remixing under way, drainage measures, two realignments, a tree-clearing program to increase safety on a curve, and some excavation to ease his snow problem.

A Job Away From Home

Bob Baker has the kind of a job which separates the sheep from the goats. Without a storehouse of self-reliance, knowledge, and the ability to get work done, he would be unable to match his assignment. His work is never in the shadow of division headquarters, even though he is, technically and officially, Division Superintendent of Maintenance in Division 5 at Tonopah. He is responsible directly to D. H. Hayes, Division Engineer.

Division 5 embraces a vast land. It is greater in area than many of the eastern seaboard states. Stretching

(*Continued on next page*)

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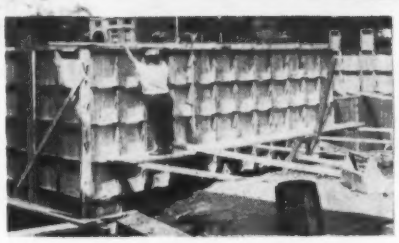

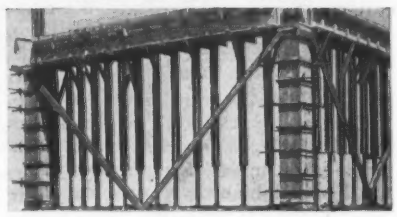

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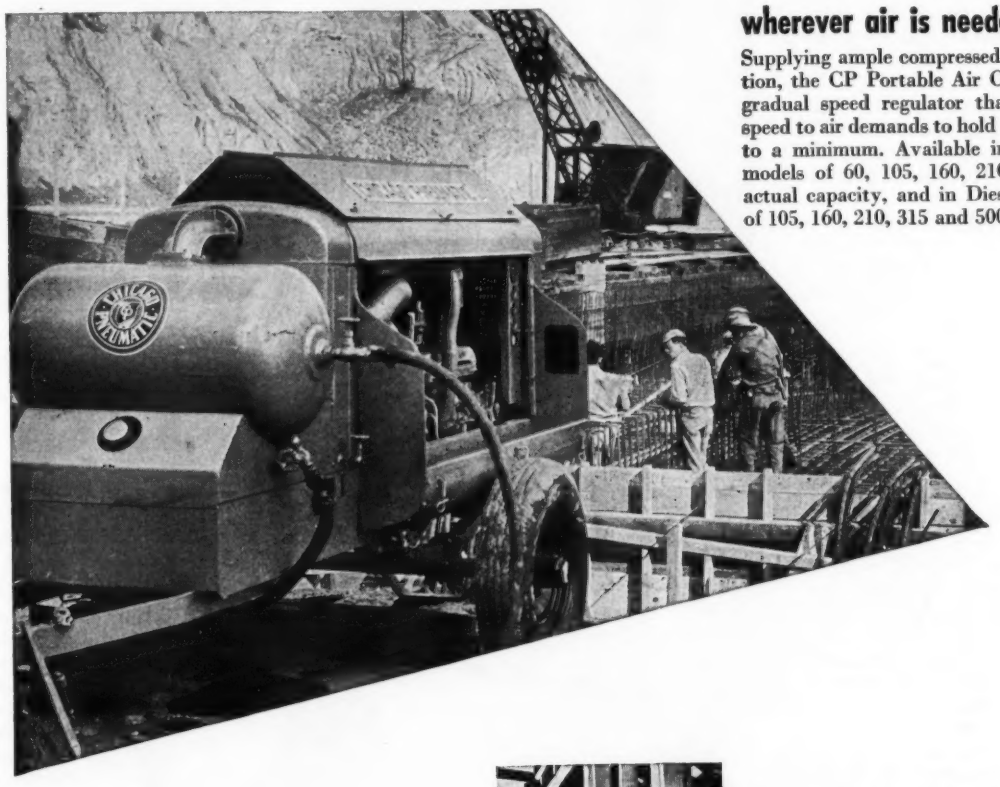

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Experience Is the Best Maintenance Formula

(*Continued from preceding page*)

from California's Sierras across to Nevada's own high mountains in the east-central part of the state, the division includes highways in Lander, Nye, Mineral, and Esmeralda Counties. It is a magnificent, lonely country, with here and there a ranchhouse, a mine, or perhaps a small town which breaks the everlasting sameness.

Some 750 miles of state, secondary, and Federal highways cross the division. The main transcontinental routes are U. S. 6, 50, and 95. Out of this total mileage, about 45 are high-type plant-mix asphaltic concrete; 580 miles are bituminous road-mix construction; and about 125 miles are gravel.

What kind of people travel these highways? Well, there are ranchers, of course. There are local trucks, because that is the only means of supply for many of the towns. There are tourists, buses, and interstate trucks.

Happily, the traveling public is one of Baker's minor problems. His major one is the same puzzle which hounds highway maintenance men all over the nation: the steady, sometimes almost imperceptible deterioriation of his highway system. If it isn't pavement break-up, it's winter snow. If it isn't a hurry-up remix job, it's a bad cloudburst away out where Helen's gone in the mountains. It's touch and go from the time the boys start putting on snow plows until the first storm hits the high passes. It's a never-ending kaleidoscope, with field work and experience paying off in each scene.

A Typical Year

To understand how Baker works, and how he has arrived at some of his decisions regarding maintenance, it is necessary to know something of his particular assignment. Because of the long distances, the wild remote country, the lack of cities, Baker's job calls for organization to the highest degree.

Take a typical year's work, for example. January and February are snow months. During these two months Baker and all of his men work perhaps harder than any other time of the year. Many times they are out 25, 30, even 60 hours at a time, in weather which gets down to 25 below zero.

During March, crews clean up the snow in the higher passes, and by the end of the month the snow problem is cured for the time. During the latter part of March and all of April, Baker has to organize everything for the summer's work ahead. His crews do routine patching, they clean up for remixing jobs ahead, their equipment makes aggregate and chips, guard posts and shoulders are taken care of, and a comprehensive survey is made of winter damage. This gives an excellent idea of what work lies ahead for the summer.

Photo courtesy of R. E. Baker

Twenty-three miles east of Tonopah, Nev., a Division 5 Walter truck with V-plow reopens a road cleared just 15 minutes before this shot was taken.

May is really a continuation of April's activities. Alignment changes can be made that month, if they are not too extensive. Culverts are cleaned, more aggregate is produced, and sight distance around curves is improved by clearing brush and trees out of the bight of the bends. Where deep cuts or high banks cause snow to drift, Baker puts equipment to work where possible to "daylight" the earth on both sides, making the slopes flatter. There is a definite relationship, he has found, between snow trouble and the location and design of a highway.

June, July, and August are oiling months. When the hot summer sun bears down these 90 days, Baker assembles men, equipment, and materials to do a steady succession of reconstruction projects. These usually consist of ripping up and pulverizing old bituminous pavements, repairing the subgrade if necessary, making any necessary line changes, and adding whatever crushed sub-base material is necessary. Seal coat and armor work is also done. An average summer season will see 100 miles of reconstruction done.

(*Continued on next page*)

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September sees a resumption of gravel or aggregate manufacture. Chips and sand are also produced. The right-of-way is cleaned to make snow removal easier. This is the month Baker tries to get his vacation. There isn't time before September; October is too late, because most of the crew is gone—that month is deer season.

The last of October and all of November is usually taken up with equipment repair, putting it in A-1 shape, and installing snow plows on all the machines used for other purposes through the summer. All last-minute preparations are made, because any time after December 1 snow-removal work begins anew.

That gives some idea of Baker's yearly schedule. It takes many hours to direct all that, and the countless unscheduled jobs that go with it.

Snow Is Tremendous Problem

Snow is one of the toughest maintenance problems of all. The thing which makes it ironic, according to Baker—and a lot of other maintenance engineers are beginning to feel this same way—is that it wouldn't have to be tough.

The catch, of course, is people. People complicate the snow-removal problem so much. Back 15 or 20 years ago, people went around prepared for the worst storm that could happen—or they didn't go. That's not true now. Skiers will try to go anywhere, without chains, antifreeze, or very much judgement. Even the old-time western residents are getting careless. It used to be that they'd have all their winter supplies in at least by October 1. Not now. They get a few good years, when the snow doesn't come down until after Christmas, and they get careless. They even want to take a chance and leave cattle and sheep out on the range.

"More and more people are depending on highway maintenance departments to get them out if they get caught," Baker said. "You'd be surprised how much of our time is needed for rescue work. If we could use that time on our main highways, there'd never be an hour you couldn't drive in winter about the same as you do in summer."

Baker places much more emphasis on routine snow clearance than he does on any of the dramatic rescues he and his men have made. He is alert. He senses quickly the solution to a problem.

For example, he noticed that one of his main snow complications was the problem of wind drifts. He began to catalog mentally some of the worst places; to study wind direction, velocity, and characteristics of the near-by terrain. Before long he had the bad spots—the ones which gave repeated drift trouble—neatly filed away in his mind.

The trouble with some maintenance men is the fact that that's where the drifts would stay: filed away in their minds. Baker did something about them. He fought those places with everything at his command. If the trouble was brush or trees, he cut them. If deep cuts were at fault, he moved equipment in the first chance he had and daylighted the banks, flattened everything down so the wind would clear the snow instead of drifting it.

"The day is coming soon when the maintenance man has to fix up his highways so they'll take care of their own snow as much as possible," is Baker's opinion. "Maintenance crews will soon be too busy rescuing people, if the public keeps getting softer and more careless."

When everything is all rigged up to fight snow, Baker has available about 30 small one-way push plows on KB-6's and Chevrolet trucks, five Wagner Scoopmobiles for loading snow in the towns, 8 FWD's with heavy-duty V-plows, and 6 Walter Snow Fighters. Part of the Walter machines are V-plows, some are one-way machines, and they now have a new Walter snow wing.

Baker and his men had noticed for a long time that snow had certain mechanical characteristics which, if not properly dealt with, would complicate the removal problem. When the snow first began to fall, for example, small push plows pushed it out to the side without too much trouble. Say it laid out there in a ridge 24 inches high. That was bad, because the wind would then drift the space between the ridges, and soon the highway might have 2 feet of snow, even though the fall was much less. That practice, if kept up, resulted in all kinds of complicated situations in bad storms.

The purchase of the Walter wing has cured that trouble, because the wing will take the snow far enough out where it no longer causes damage. It will also flatten down the ridges.

"Ordinarily the wing will take care of anything we get here," Baker said. "The winter before last we had to borrow a rotary, when it was so bad, but that was most unusual." Baker added an interesting observation: that the storm of 1936-37 was much worse than 1948's record snows. "Or at least it seemed a lot worse, probably because we didn't have as much or as good equipment then as we do now."

Technically, Baker fights snow about the same as anybody else. He doesn't claim to be a superman. He starts first with his smaller plows, following them with a larger machine to get the snow as far out of the shoulder line as possi-

(*Continued on next page*)

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(*Continued from preceding page*)

ble. As the snow gets heavier, he uses bigger equipment, praying that the storm won't ever get bigger than the equipment, or that somebody marooned away off somewhere won't have to be rescued. But the point is, he and his men *work*. They are not satisfied merely to go out and plow to a certain point and turn around.

"That gets you exactly nowhere," he said. "To open up a highway, or to keep one open, you've got to work it all."

They do, and sometimes it keeps them away from headquarters 48 hours at a time or longer.

Baker and his men have had their share of rescues, too. For some years Baker had his own plane, and he still flies a chartered plane when necessary. The winter before last, by using this ship to locate marooned people, Baker was able to direct rescue equipment more intelligently. He hopes some day to see two-way radio equipment on the snow-fighting machines especially, but the state is so far not prepared in that regard.

He and his crew spent many an hour last winter trying to trail an old miner who was trapped in the storm. One by one they located the miner's acquaintances. Some expressed concern over the old fellow; some were worried. A trip to the mine by bulldozer disclosed that there was food about, but there was no trace of the man.

The tractor operator searched for days. Baker kept him at it, because the sheriff by that time had become worried, fearing foul play. After many days of searching, the tractor operator plowed up the old fellow's bedroll. Searching further, he finally found the old man fast asleep under a tree. His dog had wandered around a little, hunting help. He had not touched the food which the old man carried. Instead, the dog had also chosen to lie down under a scrub pine and sleep the long slumber of eternity. Both had been frozen to death for a long time.

Questioned on his philosophy about the purchase of machines, with the thought in mind that many highway departments will be pressured into purchasing more snow-removal equipment than they have had in the past, Baker said he believed it was a good thing.

"Look at it this way: if you've got snow to move, you've got to have the tools to move it," he explained. "The public is demanding clear roads in winter, so if they're willing to pay for it, maintenance departments must get the tools and do the job."

Bituminous Roads Take Time

The many miles of bituminous highways in his division take up a great deal of Baker's time. Each year, in addition to routine maintenance work, he tries to rebuild about 100 miles, getting betterment funds for the purpose.

In reconstruction, as in everything else, organization and follow-through are as essential as the will to work. Quantities have to be estimated accurately, and that means more than an on-the-spot inspection. It requires a great deal of the knowledge which comes with long experience, because how else can one estimate accurately the amount of asphalt a certain grade of decomposed granite will take?

Baker tries to plan his reconstruction work so the materials—usually asphalt—will flow right out to the job on a precision schedule, timing perfectly with the efforts of men and machines. He also tries to have what equipment he needs to do a job: that and no more.

Such a typical reconstruction was under way on U. S. 50 near Austin recently. Approximately 4,000 feet was broken up in 3 hours by a scarifier on a grader. Pulverizing with a Hyster open-type roller took most of a shift. Two more hours were required to put in the oil, another shift by grader completed the road-mixing, and re-laying and rolling required another 3 hours.

Through it all, Baker appeared regularly to check on details and make sure that the reconstruction was as good as or better than the original work. The finished product was smooth, durable, and workmanlike.

Almost all bituminous patching material is premixed on roadside tables some distance off the highway, loaded by Scoopmobile to trucks, and delivered to the road. Baker finds that mixed-in-place or macadam patches are slow, costly, and inferior because they usually take too much time and contain too much asphalt.

One of the things Baker stresses is the fact that his men are expected to be expert at many things. Alvin "Swede" Anderson, for example, is a Barber-Greene loader operator, but he does just as well driving a transport truck or much of the other equipment. Baker himself can and does operate practically every piece of equipment in his division. Ernie Stockwell, a Maintenance Foreman, is an expert shovel runner and a motor-grader operator. Bill Mitchell is a distributor operator, but he like the others isn't too proud to do other things.

"That kind of a crew is flexible," is Baker's contention. "Without it, the maintenance man is lost."

Many Years of Service

Baker has had many years of service.

(*Concluded on next page*)

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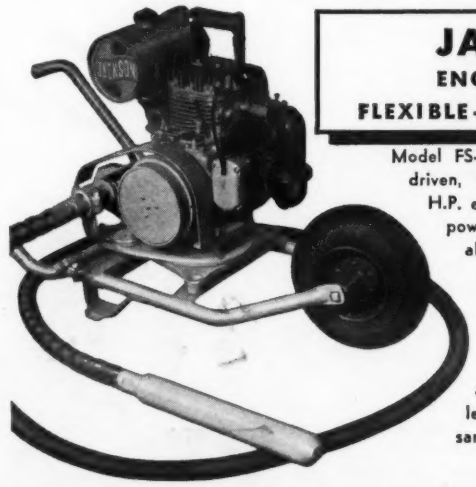

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Starting as a truck driver with the Nevada Department of Highways back in 1926, he worked near Hawthorne. Almost all the roads were dirt or gravel in those days. Between periods of employment with the State, he worked for contractors, but his primary interest lay in maintenance work. In 1935 he got a job as Construction Supervisor at Tonopah, and with the exception of a leave during the war, has worked at construction and maintenance ever since. During the war he had charge of all heavy equipment at the Basic Magnesium plant at Gabbs Valley.

Around V-J Day somebody at the plant told Baker, whose feet were itching to return to highway work, that he was frozen there for the duration.

"Like hell I am," said Baker, packing his bag. He left that day. Today his home, where his wife and daughters live, is in Tonopah.

It takes that kind of spirit to direct a far-flung job of highway doctoring in remote places. For Baker has seen a lot of the game, if not all. He has stood freezing beside a camp fire in a blizzard, directing the work, trying to keep warm with coffee brewed in a Prestone can—with green scum boiling out of the seams. He has had his share of the headaches, and he likes them.

Far out into deep water now in the green depths of the subject of politics, this man ventured a comment which is one of the most truthful things ever to come out of this typewriter.

"No politics, mine or yours, mister, can take the place of *long, steady years* out here in the field finding what this game is all about."

And the only way to get those long, steady years is to make highway maintenance a real career, as Baker has done.

Two Truck-Mixers Of Improved Design

Two new Challenge truck-mixers, a 3 and a 5 to 6-cubic-yard model, have recently been engineered by the Cook Bros. Equipment Co., 1815 N. Broadway, Los Angeles 31, Calif. Tailored to truck chassis capacities, the 4,200-pound 3-yard model is for 2-ton trucks; the 6,200-pound 5 to 6-yard unit is for 3-axle and dual-drive trucks in either the 2 or 3-ton class. Clearance requirements for the two models are 9 feet and 10 feet 4 inches respectively.

The Challenge mixers carry a full load without a seal on the discharge opening, and they will discharge without a chute since the mixer is mounted so that it overhangs the rear of the truck frame. Extension chutes 4 and 8 feet long are available for long pours. Dimensions from the top of the frame to the discharge point of the collecting chute are 39 inches for the 3-yard Challenge and 42 inches for the 5 to 6-yard models.

Controls are banked at the rear of the mixer, and a cab control allows the operator to discharge concrete while driving his truck along curb forms, for example. The chain-driven drum preserves 3-point suspension. The mixer water pump has a bronze case and impeller, and a stainless-steel shaft which operates from the mixer engine. Ford industrial power plants built for stationary operation are used. Parts or motor exchanges are universally available. The same is true of the transmissions, clutches, and universals, according to the company.

A Challenge 5 to 6-yard mixer mounted on a 145-hp Ford heavy-duty truck chassis.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 136.

Describes Attachments For Materials Handling

Attachments, tools, and accessories for handling materials with Hyster lift trucks, straddle trucks, and mobile cranes are described in a 28-page catalog (Form No. 1129) issued by the Hyster Co., Portland 8, Oreg.

Chief among the lift-truck attachments is the recently developed Load-Grab, which side-squeezes loads with sufficient hydraulic pressure to lift without the necessity of supporting pallets. A number of optional arms may be substituted for the standard Load-Grab arms. Other truck attachments listed are booms, rams, scoops, side-shift carriages, tile-handling arms, extension forks, cabs, and miscellaneous aprons, including a revolving apron.

Optional accessories include such equipment as special wheels, guards, meters, lights, and horns.

This catalog may be secured direct from the company, or by using the Request Card at page 16. Circle No. 88.

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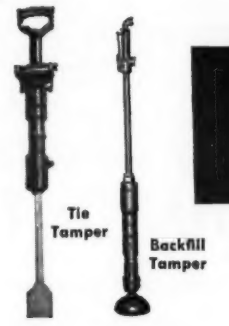
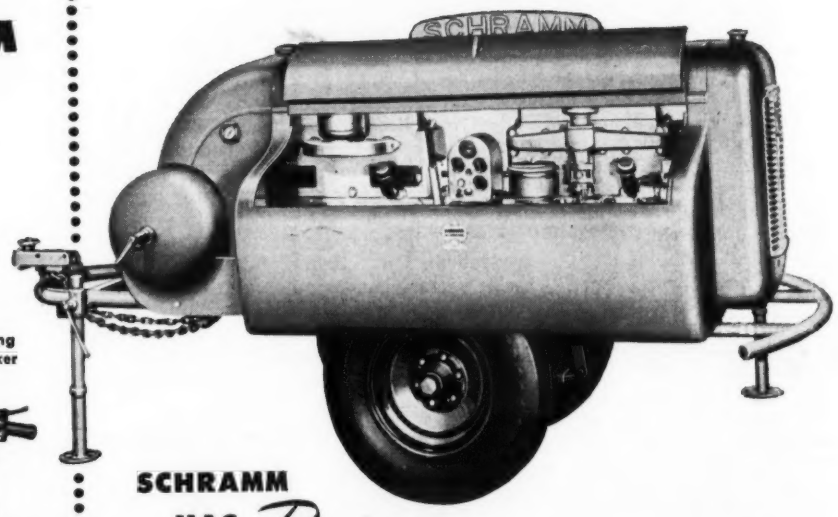


SCHRAMM TOOLS



SCHRAMM HAS *Pneumastat*
Fuel Saver Up To 50%!

The SCHRAMM *Pneumastat* gives you the advantages of: Higher average working pressure—more work from your tools... Simple and rugged construction—no valves, no checks, no pistons. Longer compressor and engine life... Lower maintenance costs... Requires no service or adjustment.

SCHRAMM HAS UNIPOWER ENGINE

Greater lugging power • Expressly designed for compressor load, speed, torque, field conditions, easy starting, continuous 24 hour service, and remote operation without attendants.

SCHRAMM HAS SIMPLIFIED DESIGN

UNISTAGE eliminates two staging and intercoolers • Fewer parts—90% of engine parts interchangeable with the compressor.

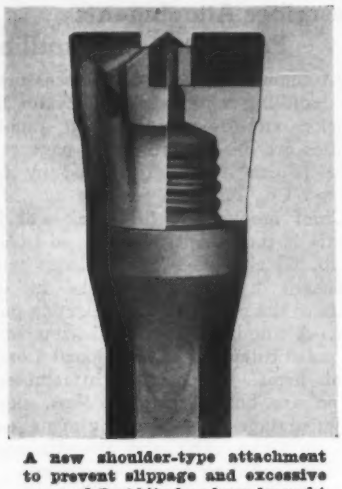
SCHRAMM PROVIDES PLUS FEATURES

Tool boxes large enough for complete assortment of pneumatic construction tools • Easy winding, full capacity hose reels • Stronger air tanks—400# test • Watercooled—can be operated with doors in place • Dual fan belts • Heavy grill for radiator protection.

SCHRAMM INC.

In addition, Schramm Inc. also offers their complete line of Golden Anniversary construction tools—a few of which are illustrated at the left. For full details write today for Bulletin SCT-50.

The Compressor People • WEST CHESTER • PENNSYLVANIA



A new shoulder-type attachment to prevent slippage and excessive wear of Jackbits has been brought out by Ingersoll-Rand.

Drill-Bit Attachment

An attachment designed to match the performance of its Carset Jackbits has been developed by Ingersoll-Rand Co., 11 Broadway, New York 4, N. Y. For use primarily with tungsten carbide bits, it is intended to have the same life and performance as the bits themselves.

The attachment is of the shoulder type employing a patented 38-degree reverse-buttress thread. It was developed particularly to resist shock and impact while still preventing slippage, excessive thread wear, or loss of drilling speed. The effect of the matching 38-degree surfaces in the bit and on the attachment, the company says, is to cushion and absorb the destructive reciprocating and rotational forces that tend to ruin bit threads or to break the threaded extensions on drill rods. The extra skirt thickness of the bit made possible by the attachment greatly increases its body strength and permits the maximum amount of skirt metal in the minimum gage size for each attachment, according to Ingersoll-Rand. Four sizes of attachments are offered to cover bit gage sizes from 1⅜ to 3 inches.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 51.

New Oil Clarifier

Of interest to contractors who have trucks, tractors, or other units equipped with base-mounted oil filters, is the new lineless, replacement oil clarifier now being offered by W. G. B. Oil Clarifier, Inc., Kingston, N. Y. The clarifier, designated as the W. G. B. Tru-Series, can be installed on the job on any single or multiple oil-filter base, and uses the standard W. G. B. T-108 replacement oil-filter cartridge. The cartridge can be changed without tools and is made of a specially processed fine cotton, according to the manufacturer.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 71.

Corrugated Steel Piling

A new fully illustrated 18-page booklet describing Corr-Plate, a rolled-steel corrugated piling, has recently been prepared by the Caine Corr-Plate Piling Co., 2535 S. State St., Chicago 16, Ill. Specification data in the booklet point out that Corr-Plate is available in 8 and 10-gage standard and interlocking steel sections 1¾ inches deep with corrugations 4 inches on centers. Dimensioned drawings illustrate the construction of regular sections, right and left-hand tees, four-way-cross sections, and corner sections.

On-the-job photos show Corr-Plate installations on cofferdams, bridges, sewers, retaining walls, dams, bulkheads, and building excavations. Full-page charts indicate recommended maximum spacing of wales, wall coverages, and number of sections required for any designated cofferdam diameter. Recommendations are also given for driving and extracting.

Accessories presented in the booklet are the company's driving caps and pulling tongs. The caps, the catalog notes, fit snugly over the corrugations; then are designed for standard lightweight sheeting hammers, air or steam-operated, and can be used for hand driving. The scissors-type pulling tongs have serrated teeth and are made from heavy cast steel.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 117.

Engine-Torque Converter, A Versatile Combined Unit

In line with efforts to develop new applications for engine-torque converters, the Detroit Diesel Engine Division of the General Motors Corp., 13400 W. Outer Drive, Detroit 28, Mich., has issued a catalog entitled "The New General Motors Diesel Engine-Torque Converter Unit."

This new 24-page illustrated booklet gives complete information on the torque converter—what it is and how it functions, where and how it has been applied—and invites power-machinery users to employ Detroit Diesel facilities in engineering particular applications in new fields. The catalog points out that the integrated diesel-engine torque-converter power unit combines the efficiency of the GM 2-cycle diesel engine with the operating characteristics of both torque converter and fluid coupling. Its design incorporates a torque converter, to start and move heavy loads, that will automatically change to a fluid coupling whenever load requirements equal engine torque.

The matched power unit enables the engine to operate in its most effective speed range, making available maximum engine horsepower and torque regardless of the speed of the load, according to the booklet. The high torque multiplication characteristics of the converter are utilized up to the point where converter efficiency drops off and horsepower starts to dissipate as heat. In this range the torque converter changes automatically to a simple fluid coupling for maximum drive and efficiency as the load speed approaches engine speed.

Cutaway drawings illustrate the operation and features of the four major converter parts: pump, turbine, first and second stator. Complete details are given on the application and installation of these units on tractors, tractor-scraper units, cranes, excavators, locomotives, drilling equipment, loaders, and other heavy-duty construction machines. Descriptions and performance curves are given for the vehicle engines, power units, and multiple-engine power units manufactured by the company.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 149.

Model Illustrated: Standard 3 cu. yd. contractors body with running boards, side braces and half-roll cab protector. Mounted over Marion model 721A hoist.

Stay Ahead of the Job With "On The Job" Design

It's the day-by-day performance that counts. That's why Marion Bodies and Hoists will help you stay ahead of the job.

Every Marion unit is designed "On The Job" under actual working conditions. Faster loading and dumping . . . extra pounds on every trip . . . longer service life . . . are engineered into every Marion unit.

MARION BODIES AND HOISTS

GET MORE DETAILS NOW
Just mail a post card or letter for the complete Marion catalog, or ask your Marion Distributor.

MARION METAL PRODUCTS CO., MARION, OHIO

Portable Gas-Electric Generator Plants. Sizes 500 to 17000 Watts. Catalog No. 815
Also Continuous Duty and Emergency Stand-by Plants 20 to 100 KW. (Apply to Dayton for quotations.)
Clay and Shale Spade
Model HP-1 Hot Tamper Plate used with Backfill Tamper
Asphalt Cutter
Master Red Seal Power Blow Electric Hammer & Spade Catalog No. 688
Model 650, D.C. Generator Plant. 500 Watts continuous duty, 650 Watts intermittent duty. Mounted on Model 98 Buggy.
Model 2500, D. C. Generator Plant. 1500 Watts continuous duty. 2000 Watts intermittent duty. Mounted on Model 83 Buggy.
Gasoline Engine Backfill Tamper Catalog No. 699 Revised
REDUCE COSTS with STURDY, DEPENDABLE
MASTER PRODUCTS DESIGNED FOR THE JOB
Every feature necessary for top performance is included as standard equipment with Master Products. ON THE JOB PERFORMANCE COUNTS. Buy right — Buy Master for sure profits and low maintenance costs.
DON'T DELAY — Write today for illustrated catalogs on Master Products.
MASTER VIBRATOR COMPANY, 110 Davis Ave., Dayton, Ohio
Electric Motor Driven Concrete Vibrator. Catalog No. 783C
Gas or Electric Turn-A-Trowell Sizes 34" or 48" Catalog No. 939
Gas or Electric Combination Disc Float and Turn-A-Trowell Catalog No. 939
Concrete Surfacing Attachments
Gasoline Engine Driven Concrete Vibrator Catalog No. 783C
Vibratory Concrete Finishing Screed Sizes 6' to 36' Catalog No. 942

Paver "Road-Mixes" Taxiway at Airport

Bituminous Parking Apron and Taxiway Are Built to Expand Paving Around Terminal Building

✦ THE latest link in the expansion of Gallatin Field, near Bozeman, Mont., was completed in short order by a Hetherington-Berner Moto-Paver. Laying close to 3,000 square yards of 3-inch paving in 8 hours, the machine finished as high as 25 per cent of its entire job in one day.

Approximately $43,000 worth of construction for 12,000 square yards of paving and incidental work was pushed to completion by Standard Construction Co. of Bozeman for the City of Bozeman and the County of Gallatin. The joint-venture field has been under development for some time, and as far back as 1942 Standard Construction Co. paved the main runways. Today the field serves commercial planes of Northwest Airlines, private unscheduled flights, and also handles some military planes.

Standard's contract called for grading, an 8-inch gravel sub-base course, a prime coat, 3 inches of road-mix bituminous pavement, and a double seal with chips.

Paver Takes Limelight

Of especial interest to engineers and contractors in Montana was the use of a Hetherington-Berner Moto-Paver to mix and lay the bituminous mat. The machine was recently purchased by Standard Construction Co., and the Bozeman airport work was its first assignment. For the first few days of operation, a factory technician from Indianapolis was on the job every hour, adjusting the machine and teaching new operators how to get the best performance.

The Moto-Paver is essentially simple. Mineral aggregate enters the machine from a forward feeder hopper, which is kept full by dump trucks. The aggregate feeds by belt to a chain bucket elevator, which dumps the material into the mixing chamber through a measuring bin and gate. The bitumen enters the mixing chamber through a metering device with variable speed, to change the content as desired. With about 1,000 gallons of asphalt storage on the machine, it can be charged with both asphalt and aggregate without stopping.

The Moto-Paver at Bozeman was a standard 12-foot model, with controlled screeds, a screw-type feeder, and a standard front-end hopper. Bad luck dogged the first attempt to use the new paver, due to a fluke accident nobody thought could happen. A large 8-inch boulder happened to get in the aggregate, went through the machine as far as the top of the bucket line, and hung there, springing the bucket shaft and doing some damage. This was repaired in short order, however, and a piece of 2½-inch wire mesh cloth from the screening plant was then installed in the front-end hopper, as ironclad insurance that it couldn't happen again.

Mix Starts at Pit

Production of the new pavement started in a pit along U. S. 10, about ¾ mile from the airport. Here a native deposit of large round gravel cropped up close to the surface. Standard Construction Co. set up a small portable rock plant in the same location where maintenance men of the Montana State Highway Commission had produced crushed rock for years.

It was not an easy pit on the crusher, because the production of fines according to specifications required about 70 per cent of the material to be crushed. The crusher was a somewhat aged machine, rebuilt through shop alterations to the point where much of its original identity had been lost. But it produced about 125 tons an hour through its jaw, rolls, and screens.

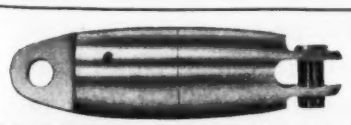
C. & E. M. Photo
Just outside the Bozeman, Mont., airport, a Wagner Scoopmobile loads aggregate for road-mix from a mixing table.

The specifications for the bituminous mineral aggregate are given in the following table:

Size Screen	Per Cent Passing
1-inch	100
¾	70-100
No. 4	35-65
No. 40	15-30
No. 200	5-15

Specifications were nearly identical

(*Continued on next page*)



A NEW ROPE SWIVEL THAT REALLY WORKS

1. Double Roller Bearings; both thrust and radial.
2. Made from heat treated alloy steel.
3. Stronger than the recommended size of wire rope.
4. Small size in relation to load.
5. Streamlined bodies.
6. Machined 100% to interchangeable tolerances.
7. All parts replaceable.
8. Permanently packed in grease and sealed against moisture.
9. Heavily plated.
10. Tested in the field and by recognized laboratories.

WRITE FOR INFORMATION

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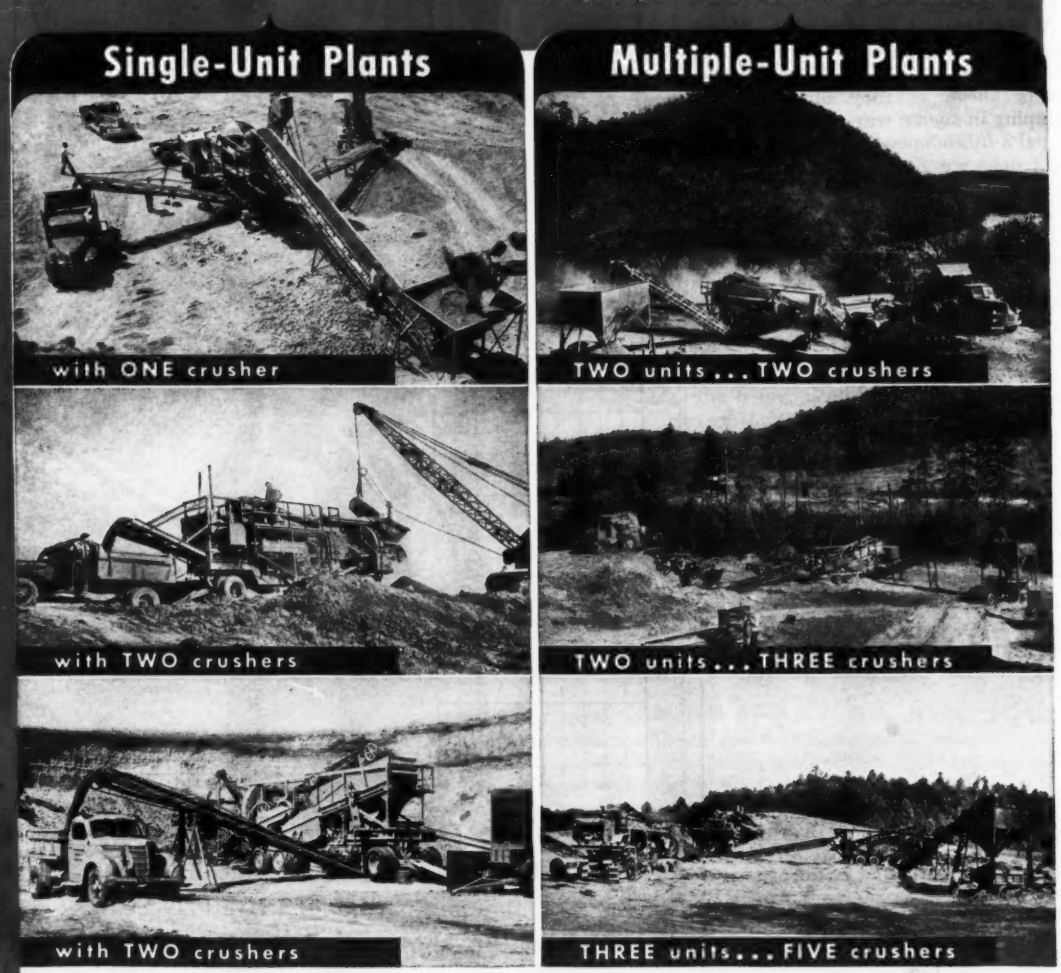
You Name It! We HAVE IT!

Portable (and stationary) rock and gravel crushing, screening and washing plants for every requirement. High speed jaw and roll crushers, with matching conveyors and screens, combined as you want them in a plant that will give you "More Rock for Less Money."



Yes, whatever your particular production problem, you will find the answer in an Austin-Western plant. Our engineering department will gladly submit sketches and estimates.

AUSTIN-WESTERN COMPANY, AURORA, ILLINOIS, U. S. A.

BUILDERS OF ROAD MACHINERY SINCE 1859
Austin Western

Paver "Road-Mixes" Taxiway at Airport

(*Continued from preceding page*)

for both the road-mix and the 8-inch gravel sub-base and the same material was used for both.

Base-course material was brought in direct by a fleet of dump trucks, dumped on the compacted subgrade, spread and mixed by an Allis-Chalmers AD-3 motor grader, and then bladed out in thin lifts and rolled by a Tampo roller drawn by an International I-4 tractor.

The sub-base was then primed with an application of 0.4 gallon per square yard of MC-2 asphalt, hauled in from a near-by refinery and applied by an Etnyre distributor. After curing for several days, the primed base was ready for road-mix.

Mineral aggregate for the road-mix was handled in a somewhat unusual way. It was first stockpiled near a mixing table at the edge of the airport. An Allis-Chalmers AD-3 motor grader cut the material from the pile, and blade-mixed it several times to obtain optimum uniformity of particles.

A Wagner Scoopmobile then loaded the mineral to three dump trucks, which hauled it to the Moto-Paver. Here again a low-cost stunt was used. The Scoopmobile operator loaded a truck, then jumped off his machine and pulled the truck ahead about 30 feet. When the next empty truck arrived, its driver jumped into the cab of the loaded machine and left the empty there to be loaded. In that way there were 3 trucks on the operation at all times, with only 2 truck drivers.

As the trucks backed in to the Moto-Paver, they stopped against the bumper of the Moto-Paver, which pushed the trucks ahead as they unloaded. By dumping in such a way that they maintained a full hopper on the Moto-Paver, the trucks were able to pull away and let another back in to the machine without losing time.

The nature of this project was such that many stops, turns, and other delays were necessary. The taxiway had one particularly sharp turn, and the parking area was odd-shaped. The Moto-Paver screed and guide were equipped with a small steel door, however, so material could be shoveled out in the corners where raking was required. The asphalt was RC-2, applied at the rate of almost 6 per cent at a temperature of 150 degrees.

After the finished material had been spread out behind the Moto-Paver in a 4¼-inch lift in order to allow for compaction, it set for about 24 hours in order to aerate. It was then compacted by a heavy Tampo pneumatic roller drawn by an International rubber-tired tractor. Finish rolling was done by a Buffalo-Springfield steel-wheel 10-ton machine.

C. & E. M. Photo

Standard Construction Co.'s Moto-Paver rounds a curve at Gallatin Field, with a dump truck feeding aggregate to its hopper.

Specifications for the seal called for an initial application of approximately 0.4 gallon of RC-2 asphalt per square yard, followed by 30 pounds of ½-inch maximum size stone chips. The second seal consisted of 0.15 gallon of RC-2, followed by 15 pounds of fine ¼-inch blot-course material. This left a water-resistant, skidproof surface for the planes to use.

Ties In to Future Work

The Standard Construction Co. bituminous work ties in to future development at Gallatin Field, and is designed

(*Concluded on next page*)

KEEP INFORMED—

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For further information and literature on products described in this issue, turn to page 16 for the Red Request Card. Our Reader Service Department will be glad to help you.

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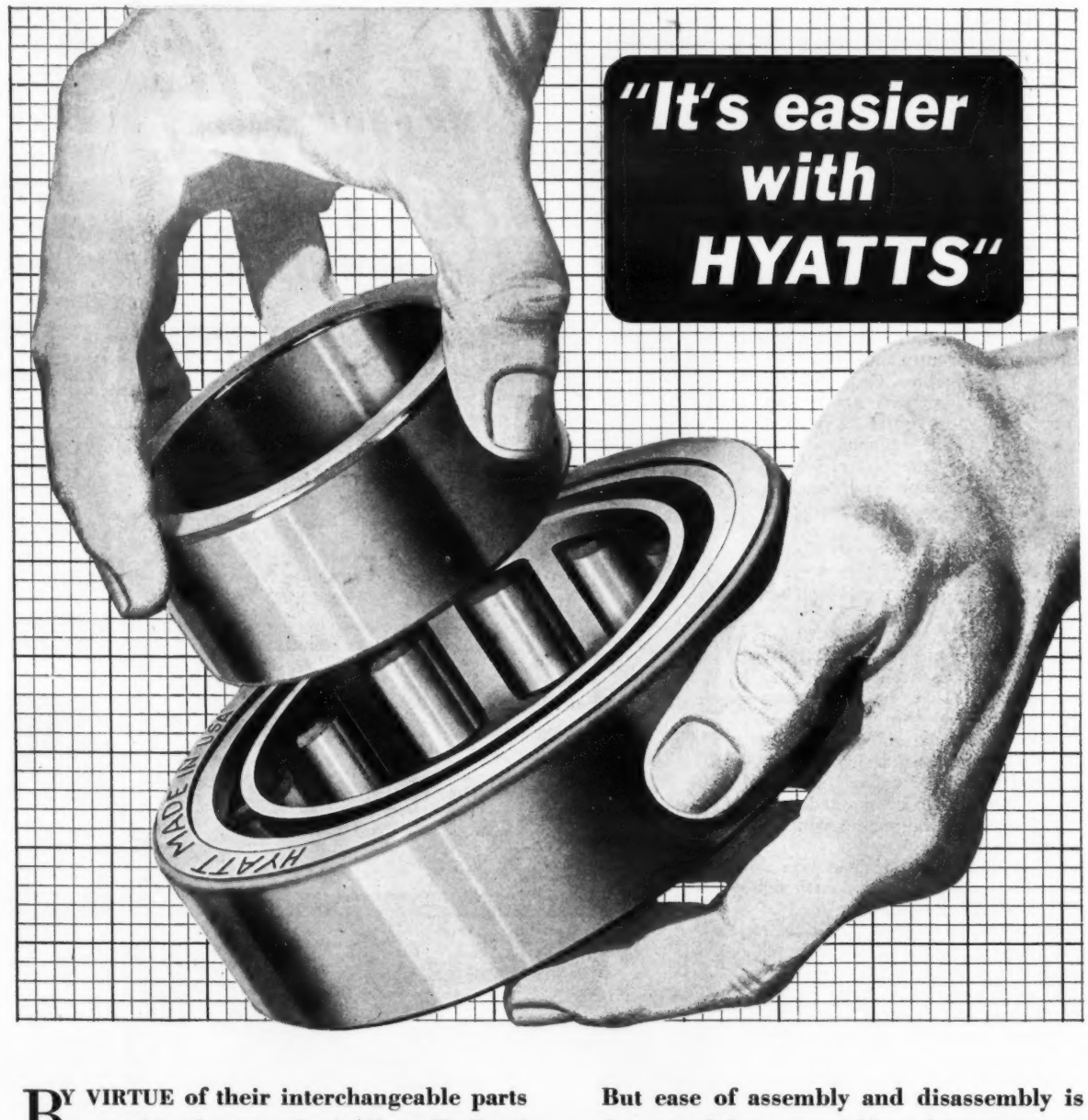
Contractors and Engineers Monthly

470 Fourth Ave.

NEW YORK 16, N. Y.



BY VIRTUE of their interchangeable parts—as this photograph of a Hyatt Hy-Load Roller Bearing shows—we make it easier for the machine builder to install Hyatts without selective fitting.

And should it ever be necessary to replace a Hyatt Roller Bearing in the field the same ease with which they can be handled is an advantage worth considering by the user.

But ease of assembly and disassembly is only part of the story. Add to this easier machine operation, design simplification and longer life with Hyatts and there's your answer to why they are the preferred bearings for the heavy duty equipment of all types. Hyatt Bearings Division, General Motors Corporation, Harrison, New Jersey, Chicago, Detroit, Pittsburgh and Oakland, California.

HYATT ROLLER BEARINGS

specifically to allow planes to come in to a future new administration building. When the new terminal building goes in, the parking apron and taxiways to serve it will already be installed.

Work on this project was done under the direction of Roy Malsor, General Superintendent of Standard Construction Co., and Joe Monger, Airport Manager at Gallatin Field. CAA participating activities were supervised from the Helena office of the Civil Aeronautics Administration, working out of the regional office at Seattle.

Oscar A. Baarson was the field representative of Fred Wilson of Bozeman, architect and engineer who designed the new terminal building and appurtenant improvements on the county-city field.

Brushless Generator For Heavy-Duty Uses

A light and power plant featuring a generator with a single solid moving part is now being manufactured by the Midwestern Engine & Equipment Co., Tulsa, Okla. The skid-mounted gasoline-engine-powered unit has been field-tested for rig lighting, welding, and pipe-thawing uses. Brushes, slip rings, and commutator are eliminated in this 60-cycle ac machine. Its only moving part is a permament-magnet rotor which revolves on pealed ball bearings.

These generators, available in 1½, 3, 5, and 7-kw capacities, are also said to be self-controlled, self-regulating, and fireproof. Voltage differential is so slight that complicated regulating equipment is not needed, according to the company. The burnout-proof armature is of all-welded construction and is wound with 5/16-inch solid copper rods capable of carrying three times the rated output of the unit. A transformer assembly made by Allmand Bros. Mfg. Co. is furnished with the generator unit to provide the required voltage variations. Designed for operation on 110-220 60-cycle current, these units may be obtained with 3-wire single-phase lines at no extra charge.

The 5 and 7-kw units are available with a built-in ac welder, including all necessary regulation outlets, welder helmets, 20-foot cable with insulated electrode holder, and a spring ground clamp.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 78.

First-Aid Ointment For Treating Burns

Americaine, a new first-aid jelly ointment for burns, is now available in unit packaging to fit the "D-Carton Interchangeable Unit System of First Aid". A two-tube unit carton is offered by the Davis Emergency Equipment Co., Inc., 43 Halleck St., Newark, N. J., originator of the D-Carton System. Americaine is an antiseptic water-soluble jelly ointment designed for painless removal. It is said to provide, in addition, the features of antisepsis, local anesthesia, and air exclusion. Other uses for which Davis recommends Americaine are creosote burns, skin irritations, insect bites, and poison ivy.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 120.

Diesel Specifications

Complete specifications for automotive and industrial models of two supercharged six-cylinder diesels, the 275-hp NHS engine and the 300-hp NHRS engine, are contained in two bulletins recently announced by the Cummins Engine Co., Inc., Columbus, Ind.

Five models are shown in each horsepower class for all types of highway, off-highway, and industrial and power applications. The bulletins contain installation drawings; photographs and charts on torque, horsepower, and fuel consumption; and general specifications for standard equipment. Both the 275-hp diesel (Bulletin No. 5285) and the 300-hp diesel (Bulletin No. 5290) turn at 2,100 rpm to develop maximum horsepower. They have a 5⅛-inch bore and 6-inch stroke, with a 743-cubic-inch displacement.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 73.

To Make Steel Bar Joists

Truscon Steel Co., a subsidiary of Republic Steel Corp., will nearly double the manufacturing space of its Gadsden, Ala., plant in order to turn out a new line of steel bar joists. This will supplement the welded wire fabric and concrete-reinforcing bars now produced at its Gadsden plant, and the complete line of steel building products fabricated at its main plant in Youngstown, Ohio.

Dallett's Contractor Tools

ASPHALT CUTTERS
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MOIL POINTS
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GADS
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DIGGING CHISELS

DALLETT'S Line of Contractor Tools are made under rigid standards and from material best suited for their intended applications. Dallett's quality tools will always give top performance.

Write for Bulletin C-220

TOOL MAKERS PNEUMATIC DALLETT EQUIPMENT ACCESSORIES SINCE 1883

THE DALLETT COMPANY
MASCHER AT LIPPINCOTT STREET, PHILADELPHIA 33, PA.
Manufacturers of Pneumatic Tools and Accessories
DISTRIBUTORS in principal cities throughout the United States, Canada, Europe and South America.

12 BIG REASONS why more and more engineers and contractors are specifying

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REG. U. S. PAT. OFF.

. . . the JOB-PROVED Bituminous Fibre Expansion Joint

No other gives you *all* these important advantages and economies!

1. Flexcell Is Non-Extruding. Millions of tiny air cells permit compression without displacement. Will not extrude under pressure by adjacent concrete slabs.

2. Flexcell Is Resilient. Re-expands on release of compression, preventing open joint crevices. Flexcell's "recovery" under severe laboratory tests is over 70%.

3. Flexcell Is Compressible. Compresses uniformly. No hard cross-grain, knots, or other defects. Gives 50% compression under load not to exceed 750 lbs. per square inch.

4. Flexcell Is Durable. Proved by years of actual use in major installations all over the nation. Withstands severest service, extremes of heat and cold. Made proof against termites and fungus by the exclusive patented Ferox Process.

5. Flexcell Adheres Firmly. Its rough-textured surface grips and holds concrete more firmly. Keeps joints closed.

6. Flexcell Stays Put. No possibility of any piece, splinter, or strip working loose and protruding above surface of slab, thus impeding or endangering passing traffic.

7. Flexcell Is Moisture Resistant. Each of the long, tough Louisiana cane fibres in Flexcell is coated with a durable moisture-proofing compound by the exclusive Flexcell Process.

8. Flexcell Has Easy Workability. Lightweight, easily cut with hand saw, readily stored, holds its shape indefinitely. Gives neat, finished joint with no trimming.

9. Flexcell Is Always Uniform. Precise scientific control during manufacture assures uniformity. Every square foot is uniformly dependable.

10. Flexcell Is Versatile. Outstanding for work requiring special cutting, tapering, and fabricating. Unsurpassed for concrete work above grade, around bridges, grade separations, overpasses, and concrete building construction. Replaces products of much greater cost.

11. Flexcell Is Economical. Measured in terms of performance and service, Flexcell is indisputably the most economical product of its type on the market.

12. Flexcell Is Quickly Available. Flexcell distributors conveniently located from coast to coast are kept supplied with ample stocks at all times. These distributors are equipped to handle all requirements, special sizes, cutting, punching—promptly, without delay!

MAJOR INSTALLATIONS LIKE THESE PROVE FLEXCELL PERFORMANCE

Flexcell has been installed in highway and bridge pavements, airport runways, sidewalks, curbs and gutters, driveways, etc., on projects such as: San Francisco-Oakland Bay Bridge, Pennsylvania Turnpike Super Highway, Chicago Municipal Airport, Knickerbocker Village, New York. Flexcell is regularly specified for use in concrete pavements by a large majority of State Highway Departments. The U. S. Army, Navy and other Government agencies are large users of Flexcell for cantonments, munition plants, housing and other projects.

SPECIFICATION APPROVALS

Flexcell meets the requirements of:

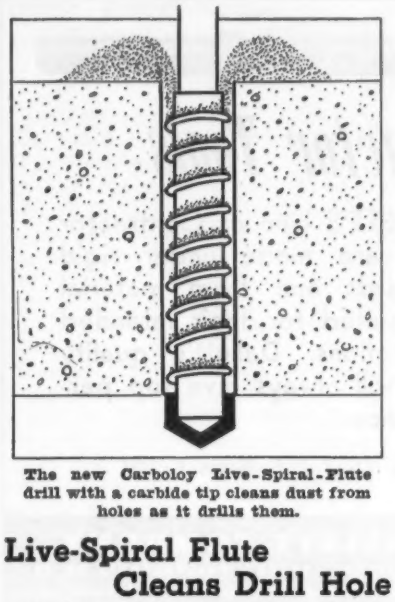
American Association of State Highway Officials Standard Specification M 59-42

Federal Specification HH-F-334

American Society for Testing Materials Tentative Revisions of Standard Specifications for Preformed Expansion Joint Filler D 544-48

Write today for complete specifications and prices on Flexcell Bituminous Fibre Expansion Joint

THE CELOTEX CORPORATION
Chicago 3, Illinois



The new Carboloy Live-Spiral-Flute drill with a carbide tip cleans dust from holes as it drills them.

Live-Spiral Flute Cleans Drill Hole

Applying high-tensile wire to form a "live-spiral" flute on the shank of a carbide masonry drill reduces the time and cost of drilling holes in masonry, brick, tile, concrete, and similar materials, according to Carboloy Co., Inc., Box 237, Roosevelt Park Station, Detroit 32, Mich.

The wire, solidly attached to the drill shank at lower and upper end, is wound around it in the form of a low-spiral helix. Dust marches up the flute as fast as it is formed instead of packing in the hole. Drilling is faster, since there is no need to withdraw the drill to remove dust. Pressure required on the drill is no greater at the end of a deep hole than at the start. Dust explosions are eliminated, less heat is generated, and drill life is increased, the company says.

The new Live-Spiral drills—which fit any rotary drill, drill press, or hand brace—are available in ten diameter sizes ranging from ¼ inch up to and including 1 inch.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 1.

Power Control Units

A new line of power control units for crawler tractors and for cable control use has recently been offered by Kay-Brunner Steel Products, Inc., Equipment Division, 2721 Elm St., Los Angeles 65, Calif. There are three models: Model C-90D, double drum, for tractors of 50 hp and up; Model C-50D, double drum, for tractors up to 50 hp; and Model C-50S, single drum, for tractors up to 50 hp. A special unit known as the Model C-90DL, for logging and extra-heavy-duty work, is marked by extra-heavy-duty clutch and cone, and special drum and control guards for added protection.

Features include alloy heat-treated cast-steel cases and covers; heat-treated alloy-steel gears; roller or ball bearings on all turning parts; high-strength alloy cast-iron clutch and brake drums; cone-type clutch; gear ratios from 5 to 1 up to 12 to 1; swinging fairleads on Models C-90D and C-50D; and adjustable control levers. Any unit can be disassembled or assembled in the field without block and tackle or hoist, according to the manufacturer.

Further information may be secured by requesting Bulletin 364-Ed. Or use the Request Card bound in at page 16. Circle No. 10.

Linear Measuring Instrument

A folder describing the Shalda Measure Meter, an instrument designed to make measuring easier, faster, and more accurate, is being offered by F. D. McGirr & Associates, 145 S. Elm Drive, Beverly Hills, Calif. The bulletin points out that the Shalda unit is pushed before the user as he walks. It automatically records distances with an accuracy of 0.1 per cent on reasonably smooth surfaces. It can be run up walls, across overheads, or around curves.

Some of its features highlighted in the illustrated circular include light weight; telescopic handle; complete registry up to 10,000 feet, in feet and fractions; and fully enclosed mechanism. The unit subtracts when it is pulled instead of pushed; and wall-to-wall measurements can be made with it by adding the diameter of the wheel.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 85.

Caterpillar to Build New Plant

Caterpillar Tractor Co., Peoria, Ill., has acquired 300 acres of land about 2 miles southwest of Joliet, Ill., on which it will build a new factory for the manufacture of earth-moving equipment. T. R. Farley, Vice President of Caterpillar, will be General Manager of the new plant.

Heads Asphalt Austin Office

George B. Finley, formerly State Maintenance Engineer with the Texas State Highway Department, is now District Engineer in charge of the Asphalt Institute's new office at Austin, Texas. The Austin office is a part of the Institute's Southwestern Division, which includes the states of Texas, Oklahoma, and New Mexico, and is under the supervision of Hugh A. Wallace, recently promoted to Division Engineer.

BE SURE TO SEE THE AEROIL 400-500-600 GALLON UTILITY SPRAY OUTFITS—*NEW*

SEND FOR FREE Bulletin No. 502

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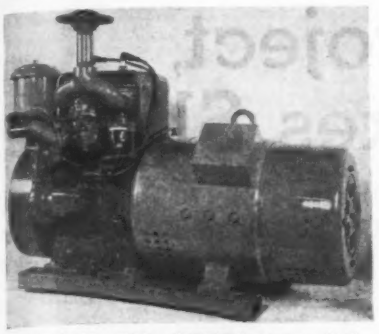

This is the Kato 45HFW4 power plant with a 5-kw self-excited ac generator. It is powered by a Wisconsin air-cooled engine, and is 37 x 28 x 22 inches.

Electric Power Plant

A new model self-excited ac generator, the 45HFW4 with a 5-kw output, has recently been designed by the Kato Engineering Co., 1415 First Ave., Mankato, Minn.

It provides 110 to 220-volt three-wire service, operating on 60 cycles at 1,800 rpm, and is powered by a Wisconsin Model TF 2-cylinder air-cooled engine with a 3¼-inch bore and stroke.

The company points out that the unit has no radiator; consequently no anti-freeze solutions are necessary. The plant can be installed in freezing atmospheres if desired. The engine is equipped with a high-tension magneto permitting hand cranking, and there is no need for batteries of any kind unless electric cranking is desired. Conservatively rated, it will start single-phase motors up to 3 hp, according to the manufacturer. The plant is available with automatic transfer switch, and is designed to give inherent voltage regulation. The voltage regulation is held to 8 per cent on noninductive loads.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 139.

Improved Form Oil

You can mix one gallon of Sta-Vis form-oil concentrate with 20 gallons of water and obtain a working mix of 21 gallons, according to the Sta-Vis Oil Co., 202 Eagle St., St. Paul 1, Minn. The mixture is stirred until milky white and then used like regular form oil.

It may be sprayed, dipped, or brushed on. There is no discoloration and no after-buffing is necessary, according to the company. The concentrated product is designed to save time, labor, and space.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 31.

Screw Driver, 3-in-1

A new 3-in-1 screw driver with a magazine-loading feature to permit quick changes from one bit to another has been announced by Selecto Products Co., 740 Superior Ave., N. W., Cleveland 13, Ohio. The three bits, two of which are in the handle, enable the tool to be used for round-head, flat-head, and Phillips-head screws. The Selecto screw driver is 7½ inches long and weighs 6 ounces. Bits are made of high-quality steel. The handle is non-breakable, non-burnable plastic.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 157.

Aggregate Wire Screens

A new 12-page catalog on wire screens for aggregate classification has recently been issued by the Woven Wire Fabrics Division of John A. Roebling's Sons Co., Roebling, N. J. This catalog, W-903, lists specifications and gives construction features for Roebling's Roeflat, Roeton, Roeslot, and double-crimp wire screens. These screens, the bulletin points out, are fabricated from Abraso steel (high-carbon spring wire), Roetemp (oil-tempered), stainless steel, monel, and various other alloys. Seven types of edges for specific cloth-wire diameters are suggested.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 19.

Portable Arc Welders

A 4-page folder illustrates and describes 15 features of gasoline-engine-driven arc welders manufactured by Hobart Bros., Box DM-853, Troy, Ohio. It gives specifications for ten different models of arc welders and combination models of arc welders and power units. Amperage ratings of 200, 300, and 400 are available. The units combining an auxiliary power generator are available with ratings of 1 or 3-kw dc power or 12-kw ac power.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 20.

Catalog on Vibrators

A new catalog describing a complete line of concrete vibrators has recently been released by the Mall Tool Co., 7743 S. Chicago Ave., Chicago 19, Ill. Fully illustrated and containing complete specifications of the models available, this catalog highlights the new method of connecting various-length flexible shafts. Increased horsepower is also announced for several of the units.

The folder points out that because the new shafts and housings are equipped with pipe thread details, it is easier to order flexible shafts. Also, flexible-shaft sections can be interchanged and so can vibrating heads, to meet changing job conditions.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 118.

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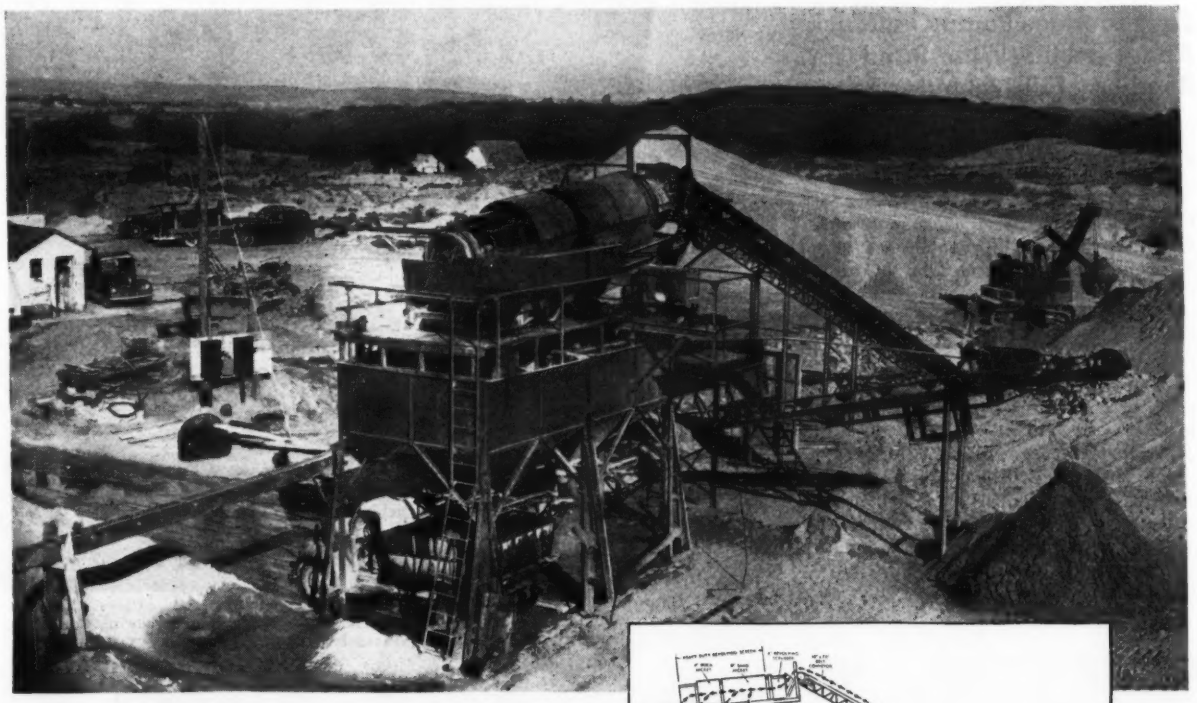
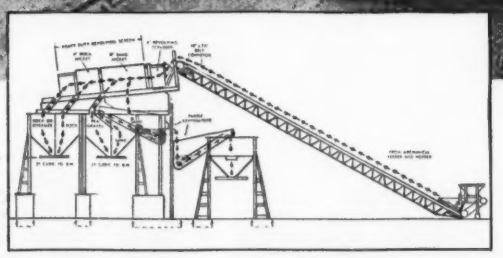


You can make real money with this Washing Plant

HERE'S AN EYE-OPENING IDEA for any ambitious contractor—a sure-fire opportunity to set up a "big city" business in any town of 10,000 people!

You've seen sand and gravel washing plants, of course. You know that this equipment is a "must" for successful ready-mixed concrete service...and for block plants...and for good concrete. And you know that this is one of the biggest profit-making operations in the whole construction field. Now, *you* can run such a business *profitably* in almost any town of 10,000 or more population.

Baraboo Concrete Products Company located at Baraboo, Wisconsin, operate the PIONEER 305-W washing plant shown above. Located in a community of about 6,500, this PIONEER Washing Plant furnishes washed material for a concrete block plant and a ready-mix fleet. It also produces washed mason sand, torpedo sand, pea gravel, inch and larger stone. According to A. L. Brown, the owner, production in a 10 hour day averages 350-400 yards of sand and from 110 to 200 yards of sized gravel.



The PIONEER 305-W is factory designed and engineered for quick assembly . . . high production. All necessary drives, spouts, and fittings are shipped with the plant.

If you want to learn how you can get into this business with a plant that is easy to install, inexpensive to operate, and that pays off in high production, mail the attached coupon today.

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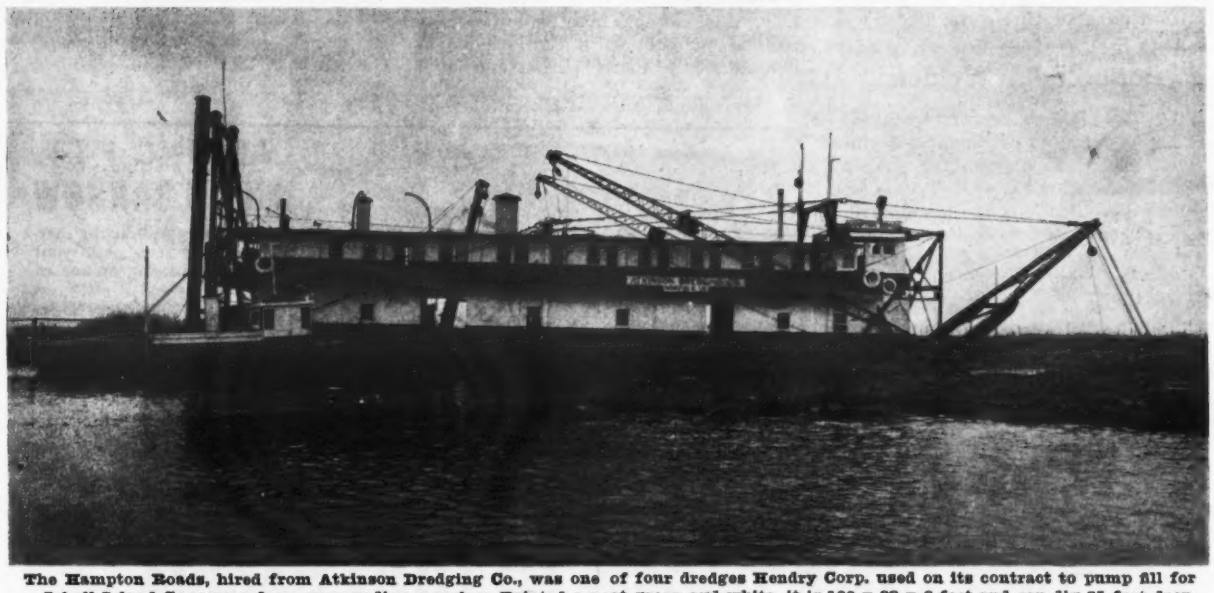
Georgia's Biggest Highway Project, A Coastal Causeway, Takes Shape



The Hampton Roads, hired from Atkinson Dredging Co., was one of four dredges Hendry Corp. used on its contract to pump fill for Jekyll Island Causeway from surrounding marshes. Painted a neat green and white, it is 100 x 28 x 6 feet and can dig 35 feet deep.

Four Dredges Pump Out Muck And Backfill With Sand for Roadway Fill 12.6 Miles Long; Dredge "Hampton Roads"

By WILLIAM H. QUIRK,
Eastern Editor

✦ ALTHOUGH it has been something of a political football ever since it was first conceived, the Jekyll Island Causeway and relocation of U. S. 17 project, near coastal Brunswick, Ga., is taking shape over the salt marshes of Glynn County. While Georgia's biggest highway project—13.6 miles total length with bridges—will probably not be finished in its entirety in 1950, as was originally hoped, the causeway as far as Jekyll Creek will be completed, thus making Jekyll Island State Park more accessible to recreation seekers than it has been in the past.

This project, being built under the direction of the State Highway Depart-

(*Continued on page* 81)

C. & E. M. Photos

Ernest E. Golden, left, captains the dredge and E. Sanford, right, is her Chief Engineer. D. Dunwody Atkinson, just behind Golden, is President of Atkinson Dredging Co. W. C. Smith, Jr., was Assistant Resident Engineer for the State Highway Department.

Includes 4,470-Foot Bridge On Relocated U. S. 17 Over Turtle River at Brunswick; Prefabricated Cofferdams

(*Photo on page* 1)

✦ THE largest single contract to date in the construction of Georgia's biggest highway project (see accompanying article) covers the substructure for the new 4,470-foot bridge over the Turtle River in the relocation of U. S. 17 near Brunswick. The State Highway Department of Georgia awarded a contract for the substructure to the Diamond Construction Co. of Washington, D. C., on its low bid of $2,871,259.42. Work got started in January, 1949, and is scheduled for completion in June, 1950.

When this article was written, no contracts had been awarded for the steel superstructure or deck; the latter will be a concrete slab, except at the lift span in the bridge which will have a steel floor grating. It was accommodate 4 lanes of traffic on its two 26-foot roadways separated by a 3-foot median. The design live load is H20-S16-44.

The substructure contract includes the construction of 2 abutments, 12 bents, and 33 piers—all of reinforced concrete. The numbering of the structures runs from north to south, and the 46 spans in that order, according to design type, include the following:

Number of Spans	Approximate Length	Design Type
10	36 ft.	Reinforced concrete deck girder
4	60 ft.	I-beam
3	107 ft. 1½ in.	Plate girder
1	107 ft. 11⅝ in.	Plate girder
9	150 ft.	Plate girder
1	165 ft.	Plate girder
1	295 ft.	Lift span
1	165 ft.	Plate girder
6	150 ft.	Plate girder
3	107 ft.	Plate girder
4	60 ft.	I-beam
3	36 ft.	Reinforced concrete deck girder

The lift span has a 139-foot vertical clearance and 250-foot horizontal clearance; it is supported on piers 29 and 30. The channel up Turtle River is 500 feet wide.

(*Continued on next page*)

Prime mover of the Hampton Roads is this Cooper-Bessemer 760-hp diesel engine amidships.

An Atlas Imperial 275-hp diesel is the main generating engine. The siren above warns if cooling water gets too hot.

The main dredge pump, just ahead of the main engine, is this 16-inch Ellicott with a 56-inch impeller.

C. & E. M. Photo
The framework for pile 35 of the Turtle River Bridge is being constructed on a barge. It will also serve as a template for pile driving.

C. & E. M. Photo
Viewed from the north shore of Turtle River, the Wiley at left excavates at one bent of the bridge while the other Wiley dumps seal concrete in another bent.

Both abutments are the open type supported on steel H-piles; they are numbered 1 and 47, north and south respectively. The 12 bents are from 2 to 11 inclusive, and 45 and 46; they are 2-column bents supported on 12-inch H-piles. Piers are numbered from 12 through 44. From 12 through 15 are on H-piles, also from 31 through 44. The other 15 piers, 16 through 30, go down to sandrock.

Piles were driven to practical refusal on rock (30 blows to the inch), and have a design load of 40 to 50 tons. The minimum penetration into the riverbed is 20 feet, while the maximum is around 35 feet. The design load for the piers on rock is 5 to 9 tons.

A Water Job

Because of the low ground along these coastal marshes, every structure except the two abutments was built within steel sheet pile cofferdams. It was possible to build out only to bent 6 on the north side with land equipment; the rest of the piers and bents were constructed from floating rigs. Concrete seals were poured at every bent and pier; they are anywhere from 3 to 23 feet thick. The deepest foundations are in piers 28 through 30; they go down to minus 45. (Mean low water is 0.0) Pier 31 goes down to minus 30.

A typical bent is supported on 18 steel 12-inch 53-pound H-piles driven in two rows on 4-foot centers, with a batter of 1½ inches to the foot. They go through a 32 x 9-foot seal, ranging in depth from 3 to 4½ feet, and project 1 foot into a 30 x 7 x 3½-foot-deep footing. The two columns rise out of a 3-foot-thick base. They average 5 feet square in cross section, and are battered ¼ inch in 12 inches. At the top they are 20 feet apart on centers and are connected by a cap 58 feet long, 2½ feet wide, 4 feet 3 inches deep at the ends, and 6 feet 9 inches at the center. Bent heights, measured from bottom of seal to top of cap, vary from 19½ to 42 feet.

The 2-column design was also used in the piers, although in the larger structures the square section gave way to octagonal-shaped columns. The columns are connected by a solid wall, and the noses are rounded out above the footings. Where the steel H-piles are used, they are embedded 2 feet into the footings. The highest is pier 28, being 93 feet from bottom of seal to top of cap. Piers 29 and 30 are 69 feet 4⅜ inches high.

Prefabricated Cofferdams

The contractor set up his headquarters and plant in the huge but now empty Brunswick shipyard on the north side of the project, and about 1,500 feet

(*Continued on next page*)

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Adaptable for all hydraulic tractors

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The *Bros* 13 wheel (Model 67) maximum capacity 13 tons. Available in straight or Wobble-Wheel* with oscillating axles. Designed for high production 4 to 6 inch fill compaction and finish jobs.

The *Bros* 7 wheel (Model 34) maximum capacity 7 tons. Straight or Wobble-Wheel* with oscillating axles. For narrow shoulder maintenance, spring rolling of turf surfaces to eliminate frost boils and re-establish root contact without crushing.

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C. & E. M. Photo
A Lorain Moto-Crane prepares to set the Vulcan No. 1 hammer with its special spud lead on top of a 43-foot H-pile at bent 3 of the Turtle River Bridge. Steam for the hammer comes from a coal-burning boiler.

Ga. Causeway Job Includes New Bridge

(Continued from preceding page)

from the nearest point of the bridge. His general plan of operations called for work to be carried on simultaneously from both ends of the bridge out to the middle, with the two main piers to be done last. Here in the yard the structural-steel frameworks for the cofferdams were constructed. The prefabricated frame was then towed out to location, sunk in position, and used as a template guide for driving the steel sheeting walls.

The frameworks were assembled and welded together on a barge. The wales overhung the sides of the barge slightly so that when the framework was carefully spotted in the right location, the barge might be pulled out from under, thus letting the steel structure sink into position. As many as 6 wales were required for some of the cofferdams; the bottom wale was always kept at an elevation above the top of seal so that it could be salvaged and used again.

Let us take pier 37 and its cofferdam as a typical example for a cofferdam layout. The cofferdam was built 44 feet 5 inches long x 12 feet 7 inches wide, and required four sets of wales. BP 12-inch 53-pound sections were used for wales, and each ring or ranger was braced with a single 8-inch WF 40-pound longitudinal strut at the center, and four cross struts of the same size beams. Vertical members were also 8-inch WF 40-pound sections. The sheet piling was Bethlehem DP2 members in 40-foot lengths. From bottom to top the profile of the cofferdam went like this:

Bottom of sheeting	—29.00 elev.
Bottom of seal	—21.00
Top of seal	—13.50
1st wale (top)	— 9.48
2nd wale (top)	— 4.95
3rd wale (top)	+ 0.55
4th wale (top)	+ 8.50
Top of sheeting	+11.00

Building the Cofferdams

For this water work the contractor has 5 Wiley 60-ton steam whirley cranes mounted on steel barges with spuds fore and aft to anchor them firmly in place. Two of these craft took up positions on either side of the structure to be built next, and hooked on to the cofferdam framework. When it was spotted precisely as to line, an H-beam was driven into the river bottom through a notch at each corner of the frame. The assembly had been turned on the barge so that the corners overhung the water to permit such driving. The cranes then eased the frame off the deck while the barge was pulled away into open water. A little water pumped into the hold lowered the barge and speeded this part of the operation.

Then the cranes lowered the framework down the four guide piles, being careful to keep it on line and grade, and at the proper level it was bolted to the steel posts. The steel sheeting was next lined up and driven, after which the H guide piles or spuds were removed from the four corners for use later. The cofferdam framework and sheeting was also salvaged and reused.

Steel for the cofferdam framework was furnished by Bethlehem Steel Co., and the welding was done with 2 Hobart 300-amp electric welders and 4 P&H 500-amp machines. The sheet piling was also Bethlehem 16-inch DP2 36-pound sections from 20 to 60 feet long. The sheeting was driven with McKiernan-Terry hammers of which there were three 10B3's and one No. 7 on the job. Removal was handled with 2 Vulcan extractors, a 400 and 800.

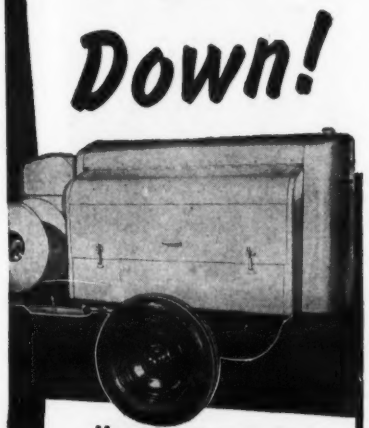
Foundation Piles

Once the cofferdams were built, the

(Continued on next page)

C. & E. M. Photo
Members of this smiling foursome are (left to right) Roy Warren, Superintendent for W. L. Cobb Construction Co.; B. E. Crumrine, Superintendent for Diamond Construction Co.; W. C. Smith, Jr., Assistant Resident Engineer; and E. W. Ellis, Resident Engineer for the Georgia State Highway Department.

Bring Compressor Costs Down!



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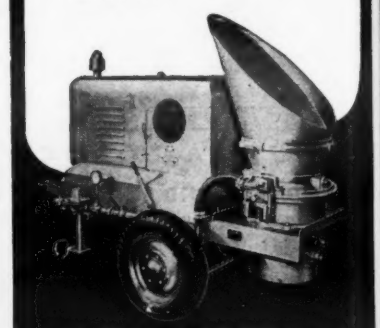

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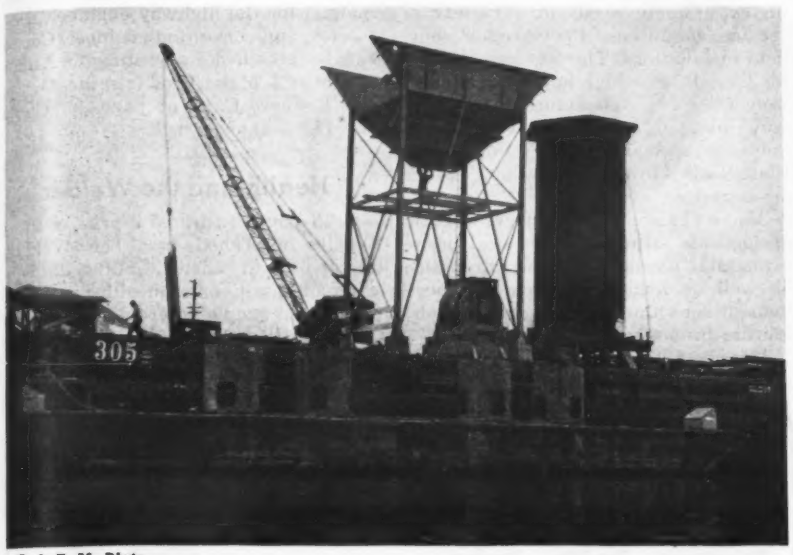

C. & E. M. Photo
The concrete plant for the Turtle River job consisted of a Blaw-Knox aggregate bin, a 1,500-barrel silo, and two Koehring 56-S concrete mixers, set up at the end of a slip opening into the Turtle River. Notice the barge with concrete buckets.

C. & E. M. Photo
Before the batch plant was set up, ready-mix concrete was used. Here two truck-mixers are chuting concrete for a seal pour into buckets on a barge. The tug will tow the barge to the bent under construction.

work proceeded in routine fashion. The Wiley whirleys excavated the insides with clamshells, 1¼-yard size, using booms 80 to 96 feet long. A P&H crane with a 70-foot boom and a 1-yard clamshell bucket was also used on this operation, being secured to the deck of a barge.

Foundation piles, furnished by both Bethlehem and Carnegie-Illinois, were then driven in the structures mentioned by a Vulcan No. 1 hammer. A novel feature of the driving was the use of a so-called "spud" lead which kept the hammer and pile in constant alignment. The hammer was clipped to one flange of a 12-inch H-beam near the top of a 35-foot section so that it slid up and down the beam. At the bottom of this lead is a clamp that opens on one side to receive the pile being driven. The pile, hammer, and spud lead are suspended by separate cables from the crane boom.

Then the pile was maneuvered under the driving cap and fitted into the clamp at the bottom of the lead. It was then clamped shut and the hammer went to work. Near the tops of the cofferdams a steel sill was laid out as a guide for driving the foundation piles. With the batter piles this template held them to position in three directions. The procedure was the same in driving piles for the land bents. Lorain and P&H truck cranes were also used in these operations.

Concreting Operations

A concrete batch plant was set up in the contractor's yard at the end of a slip opening into Turtle River. It consisted of a Blaw-Knox aggregate bin, 200-ton capacity, alongside of which was a 1,500-barrel cement silo. The Dawes Sand & Silica Co. of Forrest Pond, Ga., supplied the sand, while the stone came from Western & Brooker Co. at Camak, Ga. Lone Star bulk

(Concluded on next page)

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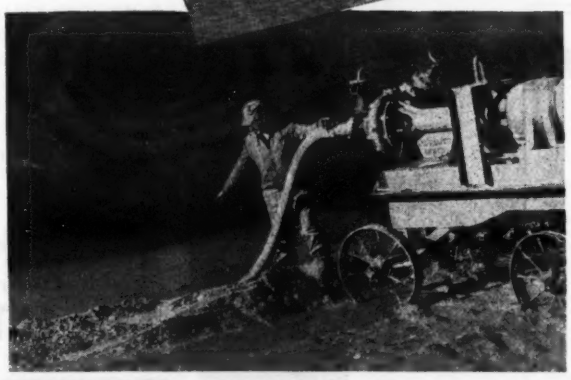
ALL-DAY SUCKER describes hose built by U.S. Rubber to meet the severe requirements of sand suction service. Each length is custom-made to take the strong vacuum needed to draw bulky wet sand, muck, coral and rock. A tough rubber tube counteracts their terrific cutting action. Wire reinforcement prevents collapse under extreme suction and constant shifting action.



WATER SUCTION AND DISCHARGE HOSE by "U. S." can readily be rounded out, if crushed or flattened in service. It is lighter in weight than ordinary constructions, yet it is remarkably flexible and durable. When the operating conditions are unusual, "U. S." engineers design a construction to meet them.

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The research and design staff of United States Rubber Company is always at your disposal when you have a question about hose. They know the latest developments in the hose field, new techniques, new methods, new economies. They can make hose do many things it has never done before, are constantly developing hose that meets new standards in efficiency, durability and safety. Write:

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Ga. Causeway Job Includes New Bridge

(Continued from preceding page)

cement was shipped in from Birmingham, Ala. Darex air-entraining agent was added to the mix at the rate of ¾ ounce per bag to give the concrete an air content of between 3 and 6 per cent. The lower figure was preferred. Materials were delivered to the plant via a siding of the Atlantic Coast Line Railroad. City water was used in the mix.

Directly beneath the aggregate bin two Koehring 56-S 2-yard stationary concrete mixers were set up on concrete bases. The materials were admitted to their drums from a weighing device directly overhead. After the concrete was mixed it was discharged onto a chute which was raised or lowered according to the tides for dumping into concrete buckets placed on the deck of barges tied up at the slip. Both Wiley and Blaw-Knox 2-yard and 1-yard concrete buckets were used. As many as 15 wooden barges, 69 x 12 x 5 feet deep, were on the project. They usually carried four 2-yard buckets of concrete set in shallow wells on the barge deck. The barges were then towed to the pier or bent being poured.

Before the batch plant was set up, ready-mix concrete was used, supplied by the Glynn Construction Co. of Brunswick. Truck-mixers chuted concrete from the wharf slip into the buckets on the barges tied up alongside. Later on, 6 or 7 tugs were used just for towing concrete out to the forms. The maximum time from when the concrete was put into the buckets until it was deposited in the forms was 30 minutes. On the average the round trip for a barge took only 30 minutes.

The Mix

Proportions for a 1-bag mix for both Class A (seal) concrete and Class Y (above the seal) concrete were:

	Class A (Seal)	Class Y (Above the Seal)
Cement	94 lbs.	94 lbs.
Sand	144 lbs.	161 lbs.
Stone, 1-in. down	280 lbs.	274 lbs.
Water	5.8 gals.	5 gals.
Slump	6 to 8 in.	1 to 3 in.

The air content was held to around 3 per cent in both classes of concrete.

Wood and Steel Forms

Special metal forms were used for the caps, but the rest of the concrete was poured in wooden forms which were fabricated in the contractor's yard, towed out to the piers and bents on barges, and erected by the cranes. Form work was speeded with a C.H.&E. band saw and a Red Star table saw. The panels were built with 1-inch lumber faced with ⅜-inch plywood. They were backed with 2 x 6 studs on 12-inch centers, and 4 x 6 wales.

Underwater concrete for the seals was placed through a tremie; it was not reinforced. After the seal was in, the cofferdam was pumped out so that the pier footing was placed in the dry. Unwatering equipment included a Jaeger 4-inch jet pump, and 6 Jaeger centrifugal pumps, 3 and 6-inch. Above the seal the concrete was reinforced with rods and bars supplied by the Truscon Steel Co. of Gadsden, Ala. It was vibrated by 3 Mall vibrators. Water was used in curing. The first pour was made in April, 1949, using transit-mix concrete; the batch plant got in operation during May.

Quantities and Personnel

The major items in the substructure bridge contract included the following quantities:

Excavation	6,300 cu. yds.
Class A concrete (seal)	3,696 cu. yds.
Class Y concrete (above seal)	30,664 cu. yds.
Reinforcing steel	1,496,500 lbs.
Steel H-piling	41,575 lin. ft.

The Diamond Construction Co. employed an average force of 100 men on the project under the direction of B. E. Crumrine, Superintendent.

For the State Highway Department of Georgia, E. W. Ellis is Special Bridge Engineer and Resident Engineer for the entire project. His Assistant Resident Engineer is W. C. Smith, Jr. The Department is headed by Jim L. Gillis, Sr., Director. M. L. Shadburn is State Highway Engineer, and C. N. Crocker is Bridge Engineer. J. O. Bacon is Division Engineer at Savannah, headquarters of the fifth division in which the project is located.

Flexible-Beam Guardrail

A new illustrated 16-page booklet called "Flex-Beam Guardrail and Bridge Rail" has recently been issued by Armco Drainage & Metal Products, Inc., 703 Curtis St., Middletown, Ohio.

The booklet outlines the factors influencing guardrail design and then points out how Flex-Beam meets highway safety needs in a variety of service conditions. Photographs show field installations. The features claimed for Flex-Beam—high impact resistance, prevention of "pocketing", economy, and adaptability—are discussed in detail. A special section is devoted to Flex-Beam bridge rails and other applications.

Also included are eight pages of basic design data. These give physical properties and tensile and beam strengths, as well as load deflections and permanent set values under various loads, for the beams and beam joints.

This booklet is a handy reference manual for the highway engineer, contractor, and consulting engineer. Copies can be obtained by writing to Armco Drainage & Metal Products, Inc. Or use the Request Card at page 16. Circle No. 154.

Health and the Welder

A 13-page illustrated reprint of three articles published by "The Welding Engineer" to answer authoritatively common questions on health hazards in welding is available from the Lincoln Electric Co., Cleveland 1, Ohio. The price is 25 cents.

Your Mixing Problem Solved:—

Bituminous Pre-Mix Paving Materials can be produced with EASE in this NEW—HIGH SPEED—HIGH VOLUME —CONTINUOUS MIXER.

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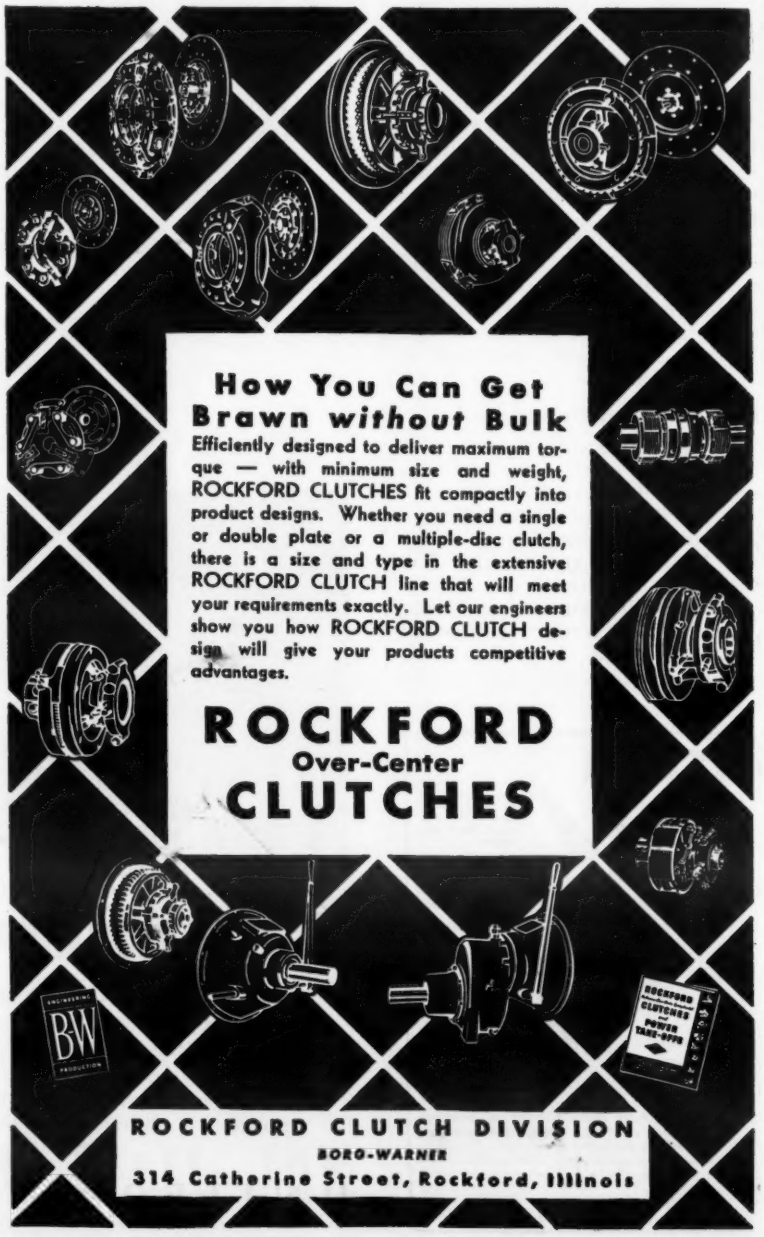

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Bureau of Public Roads Photos

Two sample views of rehabilitation work in the Philippines. Above, National Highway No. 1 is relocated south of Manila. At right, the Pasig River Bridge connecting Manila and Ayala is reconstructed at a cost of approximately $400,000.

Philippine Roads Repaired, Rebuilt

Good progress has been made in reconstructing war-damaged streets and highways in the Philippines, the Bureau of Public Roads of the Department of Commerce reports. The completed projects and those under construction are part of a program of 320 road and bridge projects planned under provisions of the Rehabilitation Act of 1946, which authorized an appropriation of $40,000,000 for highway construction in the Philippines. American contractors are eligible to bid on contract offerings, but most of the work so far has been let to Philippine contractors.

Of the 320 projects planned under the Act, 304 have been programmed at an estimated cost of $48,647,787—$33,736,000 of it to be contributed by the United States Government. These projects provide for the reconstruction or repair of 355 miles of streets and roads and 224 bridges totaling 19.6 miles in length.

During the past fiscal year, 16 road and 20 bridge jobs were completed for $3,868,300; in the preceding year, 9 jobs were completed. At the end of the 1949 fiscal year, on June 30, 75 projects were under construction and 28 had been approved for early construction by contract or force account. In all, approximately 100 miles of roadway and over 20 bridges have been built or repaired at a cost of around $6,000,000—with the U. S. contributing $5,225,000.

Some 74 bridge projects and 4 roadway projects costing about $10,000,000 are still to be designed. But most of the roadway projects were under construction by December 1, and all projects in the current highway program may be under contract by June 30 of this year.

As another important part of U. S. aid to the Philippine highway program, a physical research laboratory has been set up in Manila to test road materials and train Philippine personnel in research methods. Lab training has been given to engineers from provincial offices and field training to Philippine engineers hired as inspectors by the U. S. Bureau of Public Roads. Eight engineers from the Philippine Bureau of Public Works and two from the Philippine Army have been sent to the U. S. for special training.

The Philippines badly need modern highways and trained engineers to build them. Motor-vehicle registrations there have increased more than 50 per cent since the war. Moreover, the average motor vehicle is on the road a great deal more there than is its counterpart in the United States. Traffic counts show that several streets in Manila carry as many as 40,000 vehicles a day.

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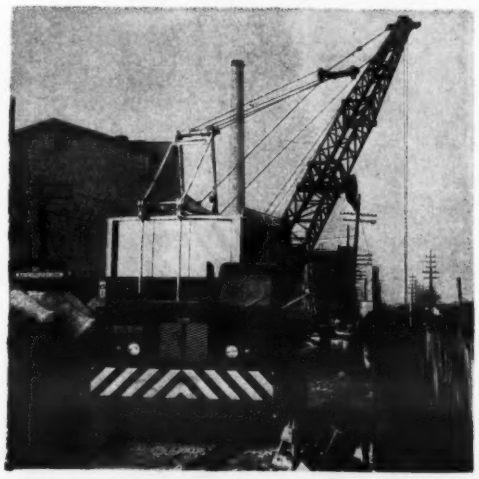

LIMA Truck-Mounted "Paymaster" that pays extra dividends because it can travel between jobs *on its own power*—at automotive speeds Type 34-T is a convertible shovel, crane, dragline or pull shovel, mounted on a standard 10-wheel truck crane carrier with independent engine for travel It has a crane capacity of 20 tons (35 ft boom, 10 ft. radius) and shovel capacity of ¾ or 1 yd., with outriggers extended. It can travel up to 31 M. P. H. Rotating equipment duplicates that of the famous crawler mounted "Paymaster", with alterations adapting it to truck mounting—thus assuring the same high peak, continuous performance which has made the "Paymaster" the leader in its field.

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You can now also get the LIMA "Paymaster" and the LIMA Type 604 (35 ton crane) in a single engine wheel mounted unit. Crawler Mounted LIMA machines are available in Shovel capacities from ¾ to 6 yards, Cranes to 110 tons and Draglines variable.

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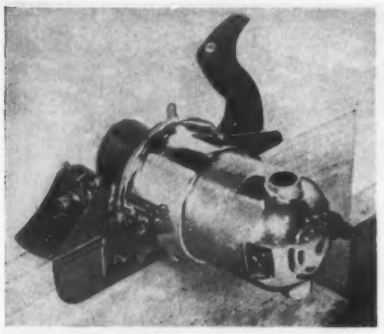

The Model 101 Guild power plane has a maximum cutting width of 1 13/16 inches and a motor which can be transferred to the Guild router.

A New Power Plane

A new power plane has recently been added to the Guild line of the Porter-Cable Machine Co., Syracuse 8, N. Y. It features an interchangeable motor which can be transferred to the Guild router.

This Model 101 plane has a maximum cutting width of 1 13/16 inches. Built with a hardened-steel cutter, it operates at a speed of 20,000 rpm, according to the company. An adjustable apron permits bevel cuts from zero to 25 degrees.

Powered by a 115-volt ac-dc 25 to 60-cycle motor, the Guild plane has a die-cast alloy frame 11¼ inches long, 8½ inches wide, and 5 inches high. Standard equipment includes a plane attachment, motor unit, plane cutter assembly, plane cutter shaft, two wrenches, and 10-foot rubber-covered 3-wire 18-gage cord.

Accessory equipment includes an attachment which will sharpen the plane cutter in 3 minutes or less; a bench stand to convert the plane into a shaper or jointer; detachable shoe plates; weatherstrip guide; and a router base for use with the plane motor. A variety of bits and cutters are available for use with the Guild router.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 133.

Data on Hard-Facing Rods

An information sheet fully describing seven types of hard-facing rods is available from the Mir-O-Col Alloy Co., Inc., 312 North Ave. 21, Los Angeles 31, Calif. The catalog explains that these rods are approximately 11 to 14 inches in length and that the electrodes in the ⅛-inch and 5/32-inch-diameter sizes have center grip—all other rods having end grip. It describes each of the rods, indicates the procedure for application, and suggests suitable applications. A price list is included. A copy of the recently revised "Welder's Guide to Successful Hard-Facing" is also available upon request.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 89.

For Mastic Spraying

A new type of gun for spraying heavy mastic coatings on the outside of buildings has been announced by A. Shelburne Co., 739 Ceres Ave., Los Angeles, Calif. The Model 105 features a large-diameter nozzle head so that more heavy fibrated or granulated materials can be sprayed without thinning.

The 105 has a spray pattern of 14 inches and larger which can be shifted from "fan" to "round" without changing air caps. A special material-handling pump drives the unit so that the material can be forced directly from the drum to the spray gun. The gun itself is lightweight, is easy to handle, and has a straight-line trigger for four-finger operation, according to the manufacturer.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 5.

Eleven-Inch Lathe

A new 11-inch lathe is now being produced by Logan Engineering Co., 4901 W. Lawrence Ave., Chicago 30, Ill. With 1-inch collet capacity, 11-inch swing, 1⅜-inch spindle hole, and center distances of 24 or 36 inches, the new Logan can do a variety of shop work.

The ball-bearing-mounted spindle permits speeds of 45 to 1,500 rpm without bearing adjustment, according to the company. The lathe is mounted on a pedestal base with the underneath drive completely enclosed. A recessed constriction at floor level of the base permits toe room for the operator and simplifies cleaning. The new lathe is available in two models which are identical in all respects except center distances: No. 955 with 24 inches between centers, and No. 957 with 36 inches between centers.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 30.

Data on Safety Equipment

The 1950 issue of "Everything in Safety" has recently been released by the General Scientific Equipment Co., 2700 W. Huntington St., Philadelphia 32, Pa. It covers respiratory equipment, eye protection, hats, gloves, carboy pumps, drum pumps, and miscellaneous safety equipment for use in construction and industry. The 46-page illustrated booklet also includes a price list.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 56.

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The transformer pictured weighed 10,500 pounds. Tulsa Winch, on the contractor's truck saved much handling time with its ability to skid the transformer in an upright position from the freight car. The smooth, even, steady pull of the Tulsa Winch was insurance against upsetting the heavy load. For dependability on the long, slow, hard pulls use the all-purpose Tulsa Winch on your truck. For literature write Tulsa Winch, Div. of Vickers, Inc., Dept. CE-1, 817 E. 1st, Tulsa, Okla.
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Tulsa Winch
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Dredges Pump Fill For Georgia Roadway

(*Continued from page 74*)

ment of Georgia, consists of two major divisions. The larger portion involves the relocation of U. S. 17, the Coastal Highway, which now enters Brunswick from Savannah to the north, winds through the congested downtown streets, and reverses itself in a circuitous manner to reach open country again on its way southward to Jacksonville, Fla. Travel is slowed and confused in the present awkward alignment which doubles back on itself through city traffic.

With the relocation, U. S. 17 will still serve Brunswick, but will skirt the business section, as it enters the city from the north, by running along the eastern fringe of town. It leaves Brunswick on a 4,470-foot bridge (see accompanying article) across the broad Turtle River. After reaching the south bank, the new road veers westward and ties into existing U. S. 17 at its intersection with U. S. 84, 12 miles below Brunswick.

The relocation portion under contract is 7.466 miles long. Besides shortening the Coastal Highway by over 5 miles, the new route saves considerable traveling time by by-passing downtown Brunswick, and skips some old bridges on the original roundabout way that would have had to be replaced before long. It likewise provides easy access from Brunswick and points north to the new Jekyll Island Causeway which connects with U. S. 17 on the south side of the long Turtle River bridge.

This other part of the overall project is nearly as long as the relocation portion. It extends east 6.117 miles from its junction with U. S. 17, on the south side of Turtle River, as far as the shoreline of Jekyll Creek. Eventually this narrow channel will be bridged by a bascule span to Jekyll Island State Park. For the time being, however, ferries will carry the cars of visitors to the island across the creek in about 10 minutes. Jekyll Island Causeway will thus permit tourists and sundry motorists to drive directly to the well known pleasure resort owned by the state of Georgia. The island already has a network of good roads, either blacktop or gravel-shell surface. (See C.&E.M., Dec., 1948, pg. 63.)

Large Contracts

Construction on the project got under way in June, 1948, shortly after the Georgia State Highway Department awarded a 12.624-mile roadway grading and paving contract to the W. L. Cobb Construction Co. of Decatur, Ga., and the Hendry Corp. of Rattlesnake, Fla., on a low bid of $2,266,486.33. The earth-work embankment, involving considerable hydraulic fill, was essentially complete by the end of 1949, leaving only the paving for 1950.

The second major contract for the construction of two bridges on the causeway went to the Scott Construction Co. of Thomasville, Ga., on an estimated price of $230,219. Work on this contract started in November, 1948. One bridge, over Fancy Bluff Creek, has been completed. It is on the U. S. 17 relocation about 2 miles east of where the new road meets the old on the way to Jacksonville. It is 618 feet long with 13 spans at 36 feet, 2 spans at 45 feet, and 1 at 60 feet.

Cedar Creek Bridge, the other structure, is east of the junction of U. S. 17 with the Jekyll Island spur. It is 291 feet long, made up of 8 spans at 36.33 feet. This bridge will be completed this spring. Both bridges have reinforced-concrete deck girder spans supported on steel H-piling, and roadways 26 feet wide.

The major bridge contract for the construction of the substructure for the Turtle River Bridge was awarded to the Diamond Construction Co. of Washington, D. C., on its low bid of $2,871,259.42. This project got under way in January, 1949, and is scheduled for completion by June, 1950. It is 4,470 feet long, and will accommodate 4 lanes of traffic on its two 26-foot roadways separated by a 3-foot median.

No contracts have been let as yet for the superstructure and deck for the Turtle River crossing. Neither has a contract been drawn for constructing the bridge over Jekyll Creek which will have its east abutment on Jekyll Island. Additional work on the project also includes the Brunswick approaches to the main river span. The contracts mentioned here, either completed or still under construction, total $5,367,965.25. Unofficial estimates place the cost of the entire project at about $9,000,000.

Roadway Project

The 12.624 miles of roadway contract were divided into several parts, accord-

(*Continued on next page*)

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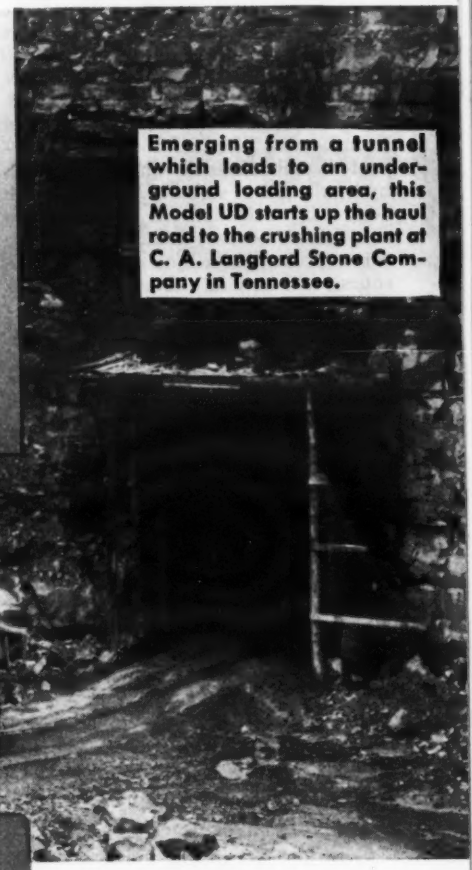

Emerging from a tunnel which leads to an underground loading area, this Model UD starts up the haul road to the crushing plant at C. A. Langford Stone Company in Tennessee.

The Acme Construction Company uses this 10-Ton Rear-Dump on a highway construction job at Matoaka, W. Va. The "Euc" is loaded with earth and shale by a 1¼ cu. yd. shovel.

Powered by a 125 h.p. diesel engine, the Model UD has a top speed of 35.7 m.p.h. and plenty of power for steep grades. The 860' haul road at the C. A. Langford quarry near Cookeville, Tenn., has a maximum grade of 10%.

High dumping angle and fast-acting Euclid hoist assure quick dumping. Here the "Euc" dumps a capacity load of limestone into crusher at the H. & R. Stone Company quarry at Ridgeville, Ind.

Built for jobs requiring a smaller capacity hauling unit for heavy off-the-highway service, the 10-Ton Rear-Dump Euclid has made good ... hauling more tons at less cost in mines, quarries, construction and industrial work. Owners like the Model UD because it is easy to handle ... has ample power and speed ... and can do a wide range of jobs economically.

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THE EUCLID ROAD MACHINERY CO.
CLEVELAND 17, OHIO

EUCLIDS

Dredges Pump Fill For Georgia Roadway

(*Continued from preceding page*)

ing to whether a section was or was not on the interstate system, and whether it had a 2 or a 4-lane roadbed and pavement. The spur to Jekyll Island is not a part of the interstate system as is the rest of the project. The southerly approach to the Turtle River bridge is slightly over a mile long and carries 4 traffic lanes, while the rest of the work is 2-lane construction. Roadway widths are either 38, 44, 71, or 96 feet, while the pavements are either 22, 24, or dual 24-foot divided.

Except for a few locations where the terrain is high enough to build the roadway embankment with the usual earth-moving equipment, most of the causeway was constructed by hydraulic dredging. Suction dredges pumped muck from the salt-water marshes over the location of the new road, and then backfilled the cut with sand pumped from borrow pits to form a well compacted embankment. The top of the hydraulic fill is stabilized to a 12-inch depth by selection of materials to achieve a 50-psi minimum bearing capacity. On this a limerock-sand base course will be laid either 6 or 7 inches deep, according to the different sections. The proportions are about half sand and half limerock, the latter coming from quarries at Perry, Ga. The base course is carried out 4 feet beyond the edge of pavement on each side.

The paving consists of a single bituminous surface treatment with liquid seal. On the spur to Jekyll Island, the 22-foot pavement has a 1¾-inch crown with 8-foot shoulders that slope ¾ inch to a foot. On the 24-foot pavement sections there is a 2-inch parabolic crown and flanking 10-foot shoulders. The dual 24-foot pavement stretch, separated by a 3-foot median, has a 2-inch straight crown on each side to 10-foot outside shoulders sloping ¾ inch to the foot. The hydraulic fill side slopes are 10 to 1, while in the regular roadbed sections on high ground side slopes are 4 to 1.

Problem of Overcutting

According to the terms of the roadway contract, payments for muck excavation and hydraulic embankment are made only for material placed within neat lines as shown on the cross sections. But in removing muck from the roadbed area, the contractor was forced to go far beyond neat lines to keep the soft material from sloughing back into the cut where the sand embankment had to be constructed. Overcutting consequently was considerable, reaching as high as 80 per cent in some sections. In general there was about 20 per cent overcut on the interstate system, and 45 per cent on the Jekyll Island spur where firm material was conspicuous by its absence.

On the U. S. 17 relocation, the muck was removed down to firm ground below, a distance from 12 to 35 feet. On the Jekyll Island spur, hard ground was not always reached in the muck removal, but in such locations it was removed to a 25-foot depth and backfilled with sand. The average elevation of the salt-water marshes is plus 7.0. They are often under water since the maximum high tide is 11 feet above low water; the average tide is 7 feet. On the Jekyll Island spur, for instance, cutting started at a point 2 feet beyond the edge of pavement and went down on a 1½ to 1 slope to the top of muck. From there it followed a line down to firm ground to a point 13 feet out from the center line. Theoretically this was to neat lines, but actually every section was overcut, the amount depending on the consistency and depth of muck, since the soft material would not stand on 1½ to 1 slopes.

The muck was pumped to spoil areas at least 500 feet from the cut, and sand was pumped in as backfill from borrow areas spotted around the marshes where clean, hard sand was available. The fill was first pumped in to reach an average elevation of 11.0 along the center line, with the natural slope of hydraulic material out to the sides. Draglines then dug out the center down to 6.0 elevation, using the excavated material to build sand dikes along the sides up to 18.0 elevation. More material was then pumped in between the dikes, filling up the roadbed section. Usually sections 600 to 800 feet long were built at a time. Sluices were installed to drain off the water, leaving only the fine wet sand, mixed with 15 to 20 per cent shells, which compacted well. Dozers shaped the top of the embankment which has an average elevation of 15.5.

Hydraulic Dredging

The Hendry Corp. did the dredging on the contract, while the W. L. Cobb

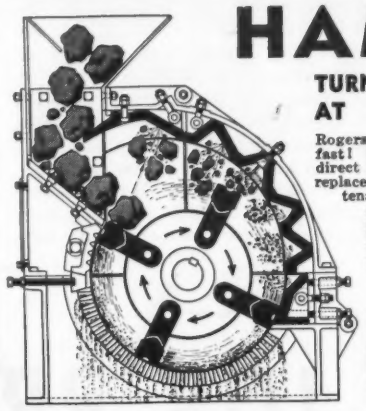
(*Continued on next page*)

ROGERS

HIGH CAPACITY EQUIPMENT FOR LOW COST ROCK REDUCTION

Double Shattering

HAMMERMILL



TURNS OUT AGRICULTURAL LIME AT 1600 R.P.M. WITHOUT A GRATE

Rogers "Double Shattering" Hammermills turn out ag-lime fast! Hammers throw rock against fixed breaker plates at a direct 90° angle, giving maximum shattering impact. Easily replaced breaker sections and hammers keep maintenance costs down. Rogers Hammermills produce high quality road rock at speeds of 800 to 1200 R.P.M. For better rock products and lowered production costs use Rogers equipment.

Write for free booklet on Rogers Hammermills

ROGERS IRON WORKS CO.

JOPLIN, MISSOURI

YOU WANT A TOP QUALITY MIX AT THE VERY LOWEST COST

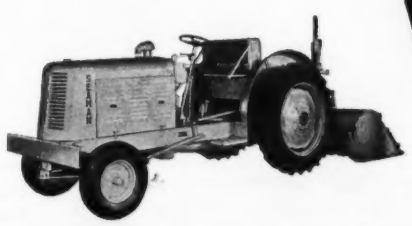
...Right!

3 MODELS TO CHOOSE FROM

THE NEW SEAMAN MIXER GIVES YOU BOTH

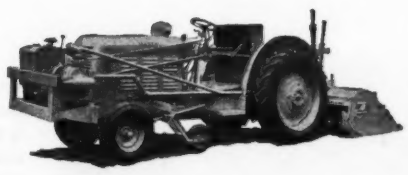
SEAMAN SELF-PROPELLED MIXER

Close-coupled, short turning radius. Standard dual transmission gives 7 forward mixing speeds plus road gear and reverse. Wide visibility. All controls in instant reach. 7 ft. mixing width.



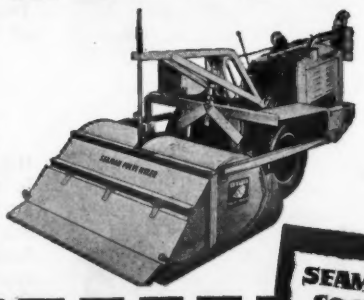
SEAMAN SELF-PROPELLED TRAV-L-PLANT

All Self-Propelled advantages plus spray bar, pump, pump tachometer and tachometer wheel for accurate, no-migrating no-evaporating admixture of bitumen or water placed most efficiently just ahead of rotor.



SEAMAN PULL-TYPE MIXER

Here selective speed transmission controls rotor speed instead of forward travel to obtain highest mixing efficiency despite variables in speeds of towing tractors.



Core samples of SEAMAN-mixed pavements, have been tested many times by impartial laboratories. Result: equal in quality to the work of central hot or cold mix plants.

That's because all NEW SEAMAN MIXERS are adjustable in either forward travel or in rotor speed to match exactly every type of soil and aggregate so that the most perfect blending of coarse and fines, the most efficient keying of aggregates and the most uniform distribution of binder is accomplished.

Now—consider cost. Road mixing is acknowledged to be the most economical method. But the SEAMAN does the job at less cost than with any other known equipment. There are good reasons: the remarkably low investment, low operating and maintenance cost, and extraordinarily high hourly output of perfectly blended and mixed materials.

SEND FOR THIS COST ANALYSIS

We'll be glad to send you a very interesting and comprehensive report on operating and maintenance costs of the SEAMAN MIXER. It tells the story at a glance. Just write for the "SEAMAN COST ANALYSIS."

—And forever after—do your mixing with a SEAMAN!

For "SEAMAN COST ANALYSIS" write to

SEAMAN MOTORS, INC.

282 North 25th St., Milwaukee 3, Wis.

Construction Co. handled the earth work on the high ground sections, also the grading and paving. Muck excavation estimates totaled 1,538,798 cubic yards, while hydraulic embankment in place came to 4,175,932 cubic yards as a contract item. The dredge work usually kept 4 dredges busy at a time. These generally included two of the Hendry Corp. fleet—the 10-inch No. 6 and the 12-inch No. 1. Two others were hired—the 16-inch Hampton Roads of the Atkinson Dredging Co., Norfolk, Va., and the 22-inch Ventnor, owned by the Hill Dredging Co. of Ventnor, N. J.

The Hampton Roads, which did yeoman's service on the job, was built by its owner, the Atkinson Dredging Co., at Norfolk, Va., in 1941. It is painted a neat green and white, and has a 4-inch wooden hull of long-leaf virgin yellow pine which measures 100 x 28 x 6 feet. From the bow a 50-foot ladder which can dredge to a 35-foot depth is suspended from a 30-foot A-frame. Two 65-foot booms forward, port and starboard, pick up 1,500-pound anchors on each side to which the ⅞-inch swing-line cable is attached. The dredge can take a 200-foot cut, but on this job the average was 175 feet. Set in brackets fastened to the stern hull are two 50-foot spuds weighing 8 tons each. They are made of ⅝-inch steel cylinders, 18-inch diameter, with the port spud used for digging and the starboard for "walking" ahead.

Diesel-electric powered, the Hampton Roads has an 18-inch intake and a 16-inch discharge. It is capable of pumping through more than 6,000 feet of line, but did not exceed 5,000 feet at the Brunswick location. The prime mover is a Cooper-Bessemer 8-cylinder 760-hp diesel engine, located on the dredge center line back amidships. Alongside to port is an Atlas Imperial 8-cylinder 275-hp diesel booster engine, hooked to the main engine in tandem by a system of V-belts. Together they furnish 1,035 hp to the main pump on a direct drive.

Dredge Hampton Roads

The pump, an Ellicott, is directly ahead of the main engine. The 18-inch intake line comes up the ladder and into the hull through a 10-foot metal-insert rubber sleeve, and then directly to the pump which has a 4-vane 56-inch impeller. It has a maximum speed of 450 rpm, but its average operation is at 400 rpm. A manhole in the line forward of the pump collects any debris, which may be removed after lifting the lid with a Yale 2-ton overhead hoist running the length of the dredge on an I-beam track. The 16-inch discharge line leaves the pump on the port side, and continues down that side of the dredge to the stern where it becomes a floating line.

Aft of the main pump engine is an Atlas Imperial 8-cylinder 275-hp main generating diesel engine, 514-rpm, that drives 3 generators. On a direct drive to the rear is a Westinghouse 175-kw generator which furnishes power for the 2 Westinghouse 75-hp cutter motors up forward, one on the starboard and the other on the port bow. Through a gear box they drive an Ellicott 48-inch-diameter 6-blade cutter head that turns an average 28 rpm with load.

Through V-belts off to each side the main generating engine operates 2 other generators. The one on the port side supplies power to a Westinghouse 30-hp motor forward on the port side, which operates the swing gear. This works 5 drums stretched across the deck near the bow, the center drum for the ladder, the next drum on each side for the side-boom swing line, and the 2 outside drums for the spuds. The starboard-side generator is for ship service, furnishing light for the dredge and power for the motors running the various pumps, compressors, electric refrigerator in the galley, etc.

All machinery was installed by the Atkinson Dredging Co., and the dredge is complete with safety and protective devices. All motors are protected by fuses, and the cutter-head motor is equipped with an automatic circuit breaker. A fire siren sounds an automatic warning signal if the cooling water for the diesels gets too hot, or the lube oil gets too low. The oiling system is also automatic. The dredge also carries a Caterpillar auxiliary diesel engine as a stand-by.

Floating Equipment

The floating discharge line is in 40-foot lengths connected by Mobile Pulley ball joints. Each section is supported on 2 pontoon cylinders, 48 inches in diameter x 18 feet long, tied together at the ends with 6 x 8 strongbacks 30 feet long. Over the pontoon line is a 20-inch catwalk made of two 10-inch planks with a 2 x 4 hand rail. A telephone line from dredge to shore is strung along the catwalk. The shore pipe consists of 16-foot sections connected by tapered slip joints. The maximum 5,000-foot discharge line required on this project was made up of 1,400 feet of pontoon and 3,600 feet of shore pipe.

Working with the dredge were 2 tugs —the 65-foot Okisko, powered by a Gray marine 225-hp diesel engine; and the 30-foot Willie, powered by a GM 85-hp diesel engine. Other floating equipment included an ex-Navy launching boat for use of personnel; a derrick boat for handling pipe, etc.; a welding barge; and water and fuel barges. A 5,000-gallon water barge, supplied from the Brunswick hydrants, kept full the 11,000-gallon storage tank on the dredge.

Fuel was supplied by the Standard Oil Co. and was trucked to Brunswick from Savannah and transferred to a 20,000-gallon oil barge. Storage facilities on the dredge included two 5,500-gallon tanks and a stand-by tank holding 5,000 gallons. The 3 big 8-cylinder diesels on the Hampton Roads consumed an average of 764 gallons of oil in 24 hours of operation. In the average week of 7 days running, they required 200 gallons of cylinder oil. Cooling water for the diesels was treated with Nalco.

(*Concluded on next page*)

Faster Ditching...Greater Versatility

BUCKEYE 406

GENERAL UTILITY DITCHER

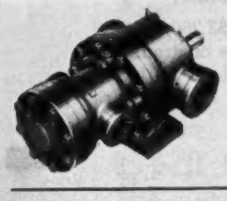
Another Cost-Cutting Application of

VICKERS HYDRAULICS

The Model 406 is a prominent member of the family of Buckeye Ditchers described as providing "The Most Ditch for the Least Money." It has a reputation for fast digging, stamina and versatility. The telescoping boom provides digging depths down to 6′ to 8′; cutting widths are from 17″ to 24″. Being exceptionally compact, the 406 works in close quarters as well as in the wide open spaces.

Vickers Hydraulics has an important part in the performance of the 406. The boom hoist is driven by a Vickers Hydraulic Motor which provides positive control at all times . . . boom cannot float or sink in ditch. Raising or lowering of boom is easily accomplished. Another Vickers Hydraulic Motor quickly shifts the conveyor from the extreme position on one side of machine to the other (or any intermediate position). When working under close or irregular conditions, this feature is invaluable in gaining clearance. The Vickers Pump shown also supplies power for the hydraulic brakes.

Vickers Hydraulics improves the operation of a great variety of construction machinery. Get in touch with the nearest office for information and data on Vickers hydraulic equipment designed and built expressly for construction machinery and information on other cost-cutting applications.



Vickers Double Pump consists of two vane type pumps driven from same shaft . . . providing power for two separate hydraulic circuits. Exclusive "hydraulic balance" construction assures longer pump life.

Vickers Sectional Type Multiple-Unit Valve is available in many combinations for convenient and selective control. Includes relief valve for overload protection.

Vickers Gear Type Hydraulic Motor has complete hydraulic balance (both radial and axial) that eliminates pressure loads, thus providing longer life, higher operating efficiency, greater practical operating pressure.

VICKERS Incorporated

DIVISION OF THE SPERRY CORP.

1492 OAKMAN BLVD. • DETROIT 32, MICH.

Application Engineering Offices: ATLANTA • CHICAGO • CINCINNATI • CLEVELAND • DETROIT • HOUSTON • LOS ANGELES (Metropolitan) • MILWAUKEE NEW YORK (Metropolitan) • PHILADELPHIA • PITTSBURGH • ROCHESTER ROCKFORD • ST. LOUIS • SEATTLE • TULSA • WASHINGTON • WORCESTER

ENGINEERS AND BUILDERS OF OIL HYDRAULIC EQUIPMENT SINCE 1921

4142

Dredges Pump Fill For Georgia Roadway

(*Continued from preceding page*)

The dredge usually pumped 22 out of every 24 hours, 7 days a week, and averaged from 10,000 to 12,000 cubic yards a day, operating with a 19 to 20-inch vacuum and a discharge pressure ranging between 70 and 80 pounds. Quarters are provided on the Hampton Roads for a 35-man crew working three 8-hour shifts. The dredge has a hot-water heating system for the staterooms and hot and cold showers; the modern galley is equipped with an oil-fired range, electric refrigerator, and a quick-freeze unit. For overall cleanliness and ship-shape appearance, the Hampton Roads is second to none.

Besides the dredge crew, a land force of a foreman and 4 laborers for each 8-hour shift was engaged on the beach setting pipe on the discharge end of the hydraulic fill.

The operations of the Atkinson Dredging Co. were personally supervised by D. Dunwody Atkinson, President of the firm. Ernest E. Golden is Captain of the Hampton Roads, and E. Sanford is its Chief Engineer. The company maintains offices in Jacksonville, Fla. and Norfolk, Va.

High-Land Grading

While the dredges were pumping hydraulic fill, the W. L. Cobb Construction Co. was engaged in roadway grading in those areas of solid ground removed from the marshes. The longest section of high land was at the western end of the causeway over a 4-mile stretch on both sides of Fancy Bluff Creek Bridge. Immediately east of the bridge, a 1,800-foot piece of roadway first had to be built with hydraulic fill before Colonels Island was graded. But high land on the island permitted the construction of 1¾ miles of embankment with land equipment. Smaller portions of high land were encountered at the eastern end of the Jekyll Island spur.

Material for the high-land embankment was obtained either from ditch excavation or from borrow pits; two good pits were located just west of Fancy Bluff Creek Bridge. Some muck was found in the roadway area in these parts, but it was removed by Lima and Lorain ¾-yard draglines and hauled away in 3 bottom-dump Euclids. Other grading equipment included an 8-yard LeTourneau Carryall pulled by a Caterpillar D7 tractor; 3 International TD-18 tractor-dozers for short earth moves or pulling a couple of Bros sheepsfoot rollers used in compacting the fill; and 2 motor graders—a Caterpillar and a Galion. A 100 per cent compaction was required, while the actual results were slightly better, ranging between 100 and 103 per cent. The grading crew averaged 35 to 40 men.

Quantities and Personnel

The major items in the $2,266,486.33 contract for the 12.624 miles of grading and paving on the Jekyll Island Causeway and relocation of U. S. 17 include:

Clearing and grubbing	58.2	acres
Common and borrow excavation, including ditches	167,015	cu. yds.
Muck excavation	1,538,798	cu. yds.
Embankment in place, hydraulic	4,175,932	cu. yds.
Limerock	35,494	cu. yds.
Limerock stabilized roadbed	242,488	sq. yds.
Cutback asphalt prime	72,178	gals.
Single bituminous surface treatment	201,478	sq. yds.
Selected compacted subgrade material	297,928	sq. yds.

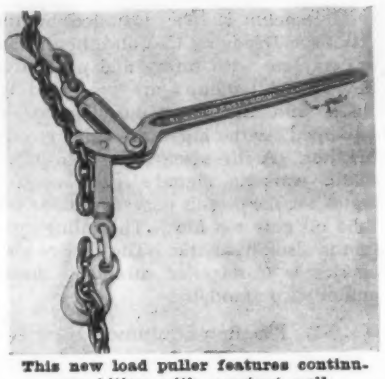
Contractor personnel on this portion of the project includes Roy Warren, Superintendent for the W. L. Cobb Construction Co. of Decatur, Ga., and L. D. Brown, Superintendent for the Hendry Corp. of Rattlesnake, Fla.

The Scott Construction Co. of Thomasville, Ga., which had the $230,219 contract for the two smaller bridges was represented by Superintendent Roy Phillips.

For the State Highway Department of Georgia, E. W. Ellis is Special Bridge Engineer and Resident Engineer for the entire project. His Assistant Resident Engineer is W. C. Smith, Jr. The Department is headed by Jim L. Gillis, Sr., Director. M. L. Shadburn is State Highway Engineer, and J. O. Bacon is Division Engineer at Savannah, headquarters of the fifth division in which the project is located.

Load-Pulling Device

A tension-pull loader has recently been placed on the market by The Canton Cast Products Co., 2408 13th St., Canton, Ohio. With this device, continuous bites may be made and all tension taken up at the first loading, according to the company. The tension-pull feature at the end of the lever is designed to maintain a constant pull at every lift of the handle. Easy-access hooks attach to heavy-duty swivels.

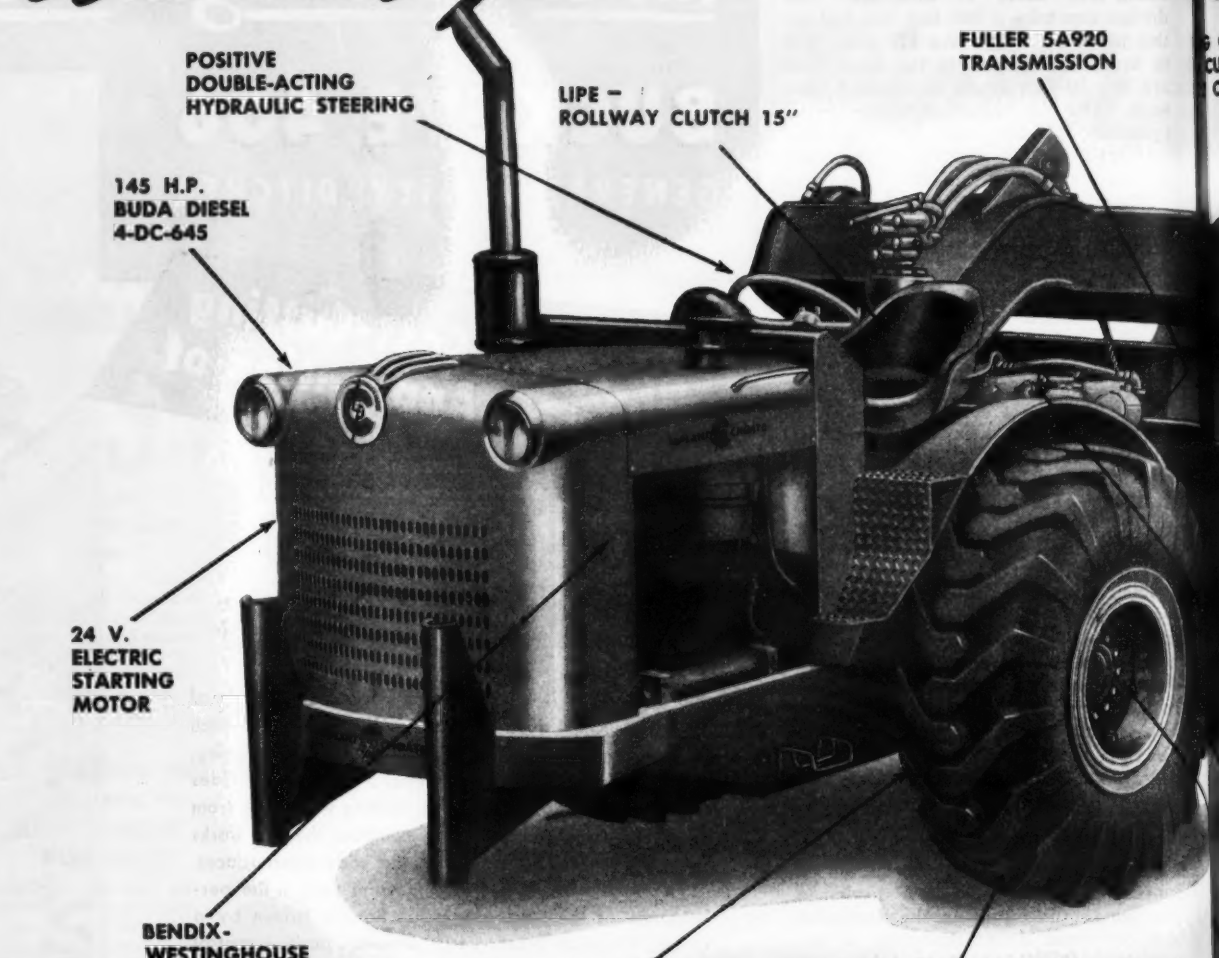


This new load puller features continuous biting with constant pull.

The loader is made in three different models. The Special model is designed for action on ⅜ and 7/16-inch chain and has a handle length of 17 inches and a design capacity of 6,000 pounds. The Standard model, for work with ⅜ and ½-inch chain, has a handle length of 19 inches and a design capacity of 15,000 pounds. The heavy-duty Loadmaster is of heavier construction and is designed for work with ½ and ⅝-inch chain. The handle length is 24 inches; design capacity is 30,000 pounds. This larger model has drop-forged hooks and features special alloyed construction.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 25.

Another great LaPLANT CHOATE


POSITIVE DOUBLE-ACTING HYDRAULIC STEERING
LIPE — ROLLWAY CLUTCH 15"
FULLER 5A920 TRANSMISSION
145 H.P. BUDA DIESEL 4-DC-645
24 V. ELECTRIC STARTING MOTOR
BENDIX-WESTINGHOUSE 7¼ CU. FT. AIR COMPRESSOR
70° TURN EACH WAY
21:00 x 25 20 PLY TRACTION TYPE TIRES

LaPLANT CHOATE

EARTHMOVING EQUIPMENT

LPC Motor Scrapers

LPC 6, 8 and 14 yd. Cable Scrapers

LPC 2 and 4 yd. Hydraulic Scrapers

Bucket-Type Loader

The pneumatic-tired Model 543 bucket loader is the latest addition to the Constant Flow line of portable material-handling equipment built by Barber-Greene Co., Aurora, Ill. The new unit has a 15-mph road speed and is steered through a truck-type worm and roller. Two forward and two reverse speeds allow the operator to compensate for material being handled and power requirements. High reverse gives fast out-of-pile speed to escape cave-ins.

An interesting feature of the new loader is its automatic load trimming. This is made possible by the hydraulic-controlled swivel-loading conveyor which may be obtained in lengths of either 13 feet 7 inches or 16 feet 7 inches. The unit's solid-plate elevating boom is mounted on a tractor-type pneumatic-tired chassis. The Model 543 clears overhead obstructions as low as 12 feet. It is designed for capacities up to 3 cubic yards per minute and will handle all bulk materials.

The Barber-Greene Model 543 swivel-conveyor bucket loader has a capacity up to 3 cubic yards per minute. It handles all bulk materials.

Further information on this loader may be secured from the company. Or use the Request Card at page 16. Circle No. 50.

Doll Is Mack Vice President

J. V. Doll has joined Mack-International Motor Truck Corp., New York City, as Vice President of Fleet Sales and Special Assistant to H. W. Dodge, Executive Vice President. For the past twenty years he has been associated with the Texas Co. as Manager of its National Sales Division.

CHOATE MOTOR SCRAPER

CAPACITY
CU. YDS. STRUCK
CU. YDS. HEAPED

POSITIVE FORCED EJECTION *PLUS* HIGH APRON LIFT

CURVED OFFSET CUTTING EDGE

DUAL LPC FLUID POWER UNIT — FOR STEERING AND SCRAPER OPERATION

4-WHEEL TIMKEN-DETROIT AIR BRAKES

The new

TS200

HERE'S another unit in the famous LPC line of profit-makers—a 9 to 12 yard high-speed earthmover—hydraulically controlled.

Speedy, agile and powerful, the "200" is small enough for all those small yardage odd jobs and utility work and yet has all the capacity and speed necessary for real high production earthmoving on those long haul jobs.

In the TS200 you get all those extra profit-making features that made the TS300 so popular—Big, rugged power, over 16 H.P. per struck yard of capacity—High speed, over 23 MPH (27.4 with optional transmission). Positive double-acting hydraulic steering and big, safe sure-stopping 4-wheel air brakes.

For BIG returns on a SMALL investment look to the "200". See your nearest LPC distributor now. LaPlant-Choate Manufacturing Co., Inc., Cedar Rapids, Iowa — LaPlant-Choate Sales and Service, 1022 77th Ave., Oakland, Calif.

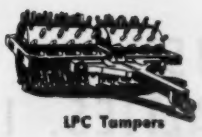
FAMOUS LA PLANT-CHOATE DOZERS

Both angling and straight blade — again available in either hydraulic or cable operated types. See your LPC distributor now!

LPC TW-300 Motor Wagons

LPC Hydraulic or Cable Operated Dozers

LPC Rippers



LPC Tampers

Convention Calendar

April 10-12—Highway Short Course
South Dakota Highway Short Course, Union Bldg., South Dakota State College, Brookings, S. Dak. Emory E. Johnson, Professor of Civil Engineering, South Dakota State College.

April 10-13—Purdue Road School
Thirty-sixth Annual Purdue Road School and Road Show, Memorial Union Bldg. and Armory, Purdue University, Lafayette, Ind. Prof. Ben H. Petty, C. E. Bldg., Purdue University, Lafayette, Ind.

April 25-27—Transportation Congress
Third Highway Transportation Congress, National Highway Users Conference, Hotel Mayflower, Washington, D. C. Arthur C. Butler, Director, National Press Bldg., Washington 4, D. C.

April 26-29—ASCE Meeting
Spring Meeting, American Society of Civil Engineers, Ambassador Hotel, Los Angeles, Calif. Ray L. Derby, General Chairman of Arrangements, Box 3669 Terminal Annex, Los Angeles 54, Calif.

June 26-30—ASTM Meeting
Annual Meeting and Ninth Exhibit of Testing Apparatus and Equipment, Chalfonte-Haddon Hall, Atlantic City, N. J. C. L. Warwick, Executive Secretary, 1916 Race St., Philadelphia 3, Pa.

Dec. 10-17—Pan American Highway Congress
Fifth Pan American Highway Congress, Lima, Peru. International Road Federation, 550 Washington Bldg., Washington 5, D. C.

New Guide Predicts Weather Conditions

A handy pocket-size personal weather guide is now available from Aeroil Products Co., Inc., Wesley St., South Hackensack, N. J. Simple to use, this weather guide, originally designed by the American Optical Co., permits accurate forecasts of day-to-day weather conditions. The guide enables forecasting for a specific area and will respond to immediate changes in conditions.

Based on research by the former Deputy Director of Weather Services and Chief of Weather Information of the United States Strategic Air Forces, the guide is operated as follows: Set the compass to due north; determine accurately the present wind direction; match the cloud diagrams on the weather guide with the overhead sky; then turn a wheel and the weather prediction will appear. There are seven different weather guides, each designed to be most accurate in a particular section of the United States. Planned to predict weather for the next 12 to 24 hours, the guide is particularly useful for contractors engaged in outdoor work where materials or job conditions will be affected by the weather.

Further information may be secured from the company by requesting Leaflet No. 649. Or use the Request Card at page 16. Circle No. 14.

All-Purpose Power Digger

A folder on a tractor-powered hydraulically operated trench digger has been prepared by Sherman Products, Inc., Royal Oak, Mich. All digger motions of this tractor-mounted unit are hydraulic, the catalog explains. To protect the tractor, a stabilizer frame on the tractor lift arms takes the digging thrust. Protection is provided for the digger by a relief valve which by-passes the hydraulic pressure when the digger reaches the limit of any of its motions.

The bulletin includes full specifications and data on the unit. Photographs and diagrams of individual parts and of the hydraulic system illustrate the principal features of the Sherman digger.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 38.

Behold, the Mighty Mouse — an 800-pound tractor which will lift 500 pounds and has a drawbar pull which is equal to its own weight.

Baby-Sized Tractor Weighs 800 Pounds

A small-size tractor for specialized construction applications has recently been developed by Mead Specialties Co., 4114 N. Knox Ave., Chicago 41, Ill. The Mighty Mouse tractor, available with bulldozer blade, bucket scoop, and snow plow, will lift 500 pounds and has a drawbar pull equal to its own 800-pound weight.

Its applications in construction work are limited only by the ingenuity of the user, says Mead. The company points out that a rugged small-sized tractor of this type can be used for bulldozing and leveling inside a 3-foot trench; for clearing or grading on roadside or soil conservation work, especially where it is necessary to get under low overhanging trees; or for other special lightweight earth-moving jobs.

A small version of its big brothers, this crawler tractor has a complete hydraulic system, a forward and reverse speed range of ½ to 6 mph, and an independent drive and brake for each track. It can pivot on either track in an 8-foot circle, says Mead, and the dozer blade can be angled left or right for snow clearing, grading, or backfilling.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 22.

Firm Makes Wire-Rope Slings

A new firm specializing in the fabrication of all types of wire-rope slings, fittings, and other cable assemblies has opened headquarters at 23570 Lakeland Blvd., Euclid, Ohio. It is called the Great Lakes Splicing & Supply Co. James R. Bryant is President. David T. Hutton, Vice President and Treasurer, is in charge of sales.

The company is an authorized distributor for wire rope produced by American Steel & Wire Co., Cleveland, Ohio.

Upset Forging Gives High Shaft Strength

An improved shaft to fit Caterpillar D8 rollers has been announced by Allied Steel Products, Inc., 7835 Broadway, Cleveland 5, Ohio. Usually, shafts have been drop-forged, with the center flange either drop-forged or brazed on the shaft. Allied has produced a shaft by upset forging which forms the center flange in an unbroken grain, designed to make it strong and resistant to wear and cracking. It is made of special precision steel, heat-treated on all bearing surfaces by the induction method to eliminate possible distortion, checking, and cracking. It is machined and ground to extra close tolerance to assure positive fit.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 28.

Rubber-Belt Repair Can Save You Money

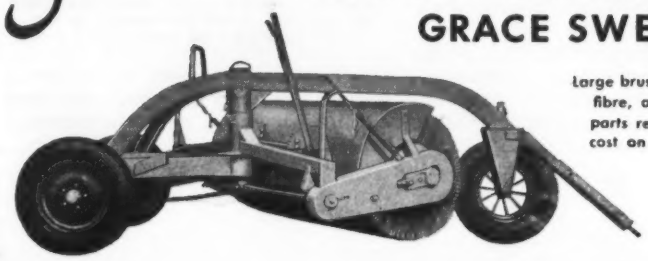
Abrasion and corrosion are constantly at work, destroying, weakening, and wasting construction equipment. Much of this equipment is protected by rubber or fabricated in whole or in part of rubber materials. But these too become worn and must be repaired or replaced. The latest development of the Self-Vulcanizing Rubber Co., 32 W. Randolph St., Chicago 1, Ill., a self-cold-curing plastic rubber compound which enables the owner of worn rubber equipment to repair it himself.

Available in kits, Selfvulc can be applied to worn conveyor belts, pump fittings, cable coverings, ducts, tank linings, and rubber parts used on classifiers, agitators, sandblast cabinets, engines, blowers, and pipes. These and other applications, the company says, can save you many dollars.

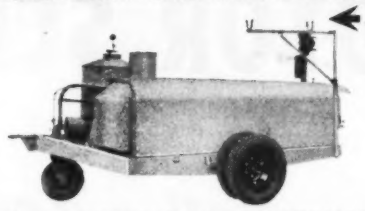
Plastic Selfvulc is a rubber compound in paste form which can be applied to practically any surface without the use of heat or special machinery. Applied over a primer, it cures itself on exposure to the air, forming a tough, resilient, impervious layer permanently bonded to the protected surfaces, according to the company. It is a nonconductor and resists electrolysis. The Selfvulc products comprise plastic and liquid rubbers, both antiabrasive and anticorrosive; primers for bonding these rubbers to various types of surfaces; cleaners for preparing the materials to be coated; and tools for their application.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 130.

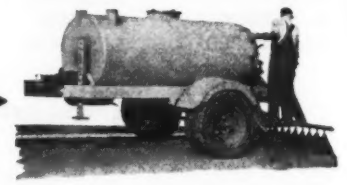
Sweep MORE MILES PER DOLLAR with 36" Dia. Brush on GRACE SWEEPERS



Large brush, chock full of fibre, and few moving parts reduce operation cost on Grace sweepers.



More ASPHALT HEATED Less Flue Repairs with RAPID-FIRE CIRCULATING HEATER for Tank Cars



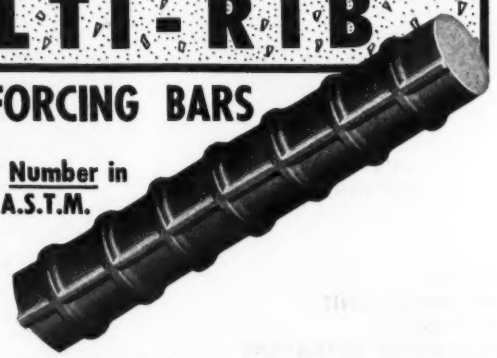
The RAPIDSPRAY MAINTENANCE DISTRIBUTOR Vacuum Cleans both Spraybar and Handspray and has other time-saving features.

W. E. GRACE MFG. COMPANY

6003 Lamar Street Dallas, Texas

The Ninth of a Series in the interest of more efficient use of steel . . . a vital American resource

LACLEDE MULTI-RIB REINFORCING BARS



NOW . . . Available by Number in Standard Sizes of New A.S.T.M. Serial Designation A305-49 Table I

Thanks to A. S. T. M. specification A305-49, designers now have a more efficient bar for concrete reinforcement . . . one that provides **increased anchorage** which when properly used will give appreciable **savings in steel and concrete.** Advanced design Laclede Multi-Rib Reinforcing Bars exceed the A305-49 specification. They are available in uniform round sections in all standard sizes and can now be ordered by number.

TABLE I A.S.T.M. SERIAL DESIGNATION A305-49

Dimensional Requirements for Deformed Steel Bars for Concrete Reinforcement

		NOMINAL DIMENSIONS ROUND SECTIONS			REQUIREMENTS OF DEFORMATIONS		
Bar No. °	Unit Wt. Lbs./Ft.	Diameter-Inches Decimal	Cross Sectional Area Sq. Inches	Perimeter	Max. Avg. Spacing Inches	Min. Height Inches	Max. Gap. Inches ‡
3	0.376	.375	0.11	1.178	0.262	0.015	0.143
4	0.668	.500	0.20	1.571	0.350	0.020	0.191
5	1.043	.625	0.31	1.963	0.437	0.028	0.239
6	1.502	.750	0.44	2.356	0.525	0.038	0.286
7	2.044	.875	0.60	2.749	0.612	0.044	0.334
8	2.670	1.000	0.79	3.142	0.700	0.050	0.383
9*	3.400	1.128	1.00	3.544	0.790	0.056	0.431
10*	4.303	1.270	1.27	3.990	0.889	0.064	0.487
11*	5.313	1.410	1.56	4.430	0.987	0.071	0.540

*These sections have the same weight and area as bars formerly known as 1" Sq., 1⅛" Sq. and 1¼" Sq.

‡Chord of 12½% of Nom. Perimeter.

°Bar numbers are based on number of ⅛" included in the nominal diameter of the bar section.

— Write us —

About specifing LACLEDE MULTI-RIB BARS on your jobs

LACLEDE Producers of Construction Steel

LACLEDE STEEL COMPANY St. Louis, Mo.

TO THE MEN WHO OPERATE DRYER UNITS

MANY OPERATORS HAVE INVESTIGATED AND INSTALLED THE VOLCANIC LOW PRESSURE SYSTEM OF DRYER OIL BURNING. IN ALL OF THESE THE OWNERS HAVE FOUND FUEL SAVINGS OR INCREASED PRODUCTION.

YOUR LETTER TO US WILL BRING FORTH EITHER A QUALIFIED ENGINEER OR DATA BY MAIL GIVING YOU THE INFORMATION ON THIS EQUIPMENT.

HOPKINS' VOLCANIC SPECIALTIES, INC.

P.O. BOX 899, ALLIANCE, OHIO

A large steering wheel is the principal improvement on the new Moto-Bug power wheelbarrow.

Improved Steering On New Power Barrow

Principal improvement in the new Moto-Bug power wheelbarrow is a large steering wheel to replace the lever bar arrangement formerly used for guiding the unit, according to Kwik-Mix Co., of Port Washington, Wis. Design of the new wheel permits the operator to handle the Moto-Bug as he would an automobile and with the same ease, according to the company. The steering-gear ratio has been increased from 2 to 1 to 4 to 1.

The Moto-Bug has a rated hopper capacity of 10 cubic feet; 1,200 pounds on the platform body. It is powered by a standard 4-hp gasoline engine and travels at speeds of 1½ to 4 mph, both forward and reverse. A direction indicator is also included with the new steering feature.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 137.

Driving Hammers And Follow Blocks

Pile hammers and follow blocks made of Eagle tough close-grain semi-steel are manufactured by the Eagle Iron Works, 129 Holcomb Ave., Des Moines, Iowa. They come in a variety of sizes and weights adaptable for different types of piling to suit individual needs. Pile hammers are made in weights from 2,000 to 3,500 pounds, with other sizes available on request. And many types of follow blocks may be obtained by indicating to the company the widths of leads, lead spacing, and types and sizes of piling to be driven.

All-steel leads of channel and I-beam construction, with rigidly supported bracing and assembled with countersunk bolts, may also be obtained from the firm. They are easily disassembled for transportation and parts can easily be replaced. Line weights can be made up for any size of cable. They are carried in stock for ⅝-inch 6-strand cable.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 95.

Welding, Coating, Repair Services for the Industry

A 4-page bulletin describing the company's services to the construction industry is available from Metalweld, Inc., 26th and Hunting Park Ave., Philadelphia 29, Pa. Bulletin W explains that Metalweld offers services such as welding, metallizing, protective coating, Rubber-Koroseal lining, sandblasting, and sales and rental of construction equipment. It maintains both a shop and field service.

The company's welding operations, the folder points out, include mechanical repair of machinery, structural repair and change, boiler repair, heavy-equipment repair, fabrication, and machining and finishing operations. Its metallizing service may be used for building up worn mechanical equipment, applying hard-wearing surfaces, correcting surface defects, restoring dimensions, and protecting surfaces against corrosion or contamination.

The construction-equipment division of the organization handles sales and rentals of compressors, air tools, pumps, concrete mixers, hoists, car pullers, yard cranes, shovels, cranes, gasoline and diesel engines, etc. The company also carries a supply of replacement parts for this equipment.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 94.

For Power on Your Job

An 8-page illustrated booklet recently issued by the Caterpillar Tractor Co., Peoria 8, Ill., discusses power requirements for excavators, compressors, electric equipment, pumps, ditchers, rollers, and movable forms. Specifications on a complete line of Caterpillar diesel engines are included in the booklet.

This literature may be obtained from the company by requesting Form 12679. Or use the Request Card at page 16. Circle No. 107.

MSA Has Warehouse in N.Y.

Mine Safety Appliances Co., Pittsburgh, Pa., has opened a warehouse at 5-45 49th Ave., Long Island City, N. Y., to serve eastern New York State and Connecticut. The building will house the company's New York City headquarters, and its 6,000 square feet of floor space will make it possible to keep a large stock of safety equipment on hand.

Twelve Pages About Trucks

A 12-page catalog on the WC Series of White trucks has recently been made available by The White Motor Co., 842 E. 79th St., Cleveland 1, Ohio. This series includes a complete line of trucks, tractors, and six-wheelers—in sizes ranging from 11,000 to 34,000 pounds gross vehicle weight for the trucks, and up to 65,000 pounds for the six-wheelers and tractors. A variety of photographs, cutaway drawings, and diagrams illustrate the design and construction features of the White line. The double-page center fold of the catalog gives specifications for the 8 principal models.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 67.

Only Adams Motor Graders give you this exclusive combination of advantages

1. 8 Overlapping Forward Speeds
2. Wide Range of Blade Positions Without Mechanical Adjustments . . . Save Time in Adapting Machine to Needed Cuts.
3. Positive-Action Mechanical Controls . . . Dependable, Accurate Adjustments—Because They're Geared . . . Easy, Natural Steering.
4. Ample Operating Clearances . . . Quick, Easy Adaptation to Work . . . Operator Comfort, Convenience, Efficiency.
5. Fast, Easy Servicing Plus World-Wide Dealer Service . . . Saves Time and Money.

4 Average-Work Speeds
for Ditching, Scarifying, Bank Work, Oil Mixing, Spreading, Maintenance, etc.

2 Intermediate Speeds
for Climbing Heavy Grades and for Plowing, Blading and Bucking Snow.

2 Transport Speeds

In Adams Motor Graders you get 2 more forward speeds than in several machines of comparable size and power—8 speeds instead of 6. These additional 2 speeds give you an extra working speed and a higher "high"—as much as 25 mph. You get an exactly *right* speed for accomplishing each grading operation at the fastest practical rate . . . plus 30 to 50% faster job-to-job transport.

Let your local dealer show you how 8 forward speeds and other Adams advantages help you to speed operations, increase efficiency, reduce costs.

J. D. ADAMS MANUFACTURING CO.
INDIANAPOLIS, IND.

Make your next motor grader an ADAMS

A crew of eight is required to wrap ⅞-inch copperized steel wire around Goodyear's huge hose under construction at its mechanical-goods plant in Akron. Total weight of the finished hose is more than 4 tons.

Giant Rubber Hose

Construction of rubber hose units weighing more than 4 tons each and measuring more than 3 feet inside diameter has begun in the mechanical-goods plant of the Goodyear Tire & Rubber Co., Akron 16, Ohio. Classified as sand suction and discharge hose, they are said to be the largest being built today. Production of the 38-inch ID hose in 20-foot lengths started as a result of a 6-year testing program on this type of hose conducted by the Corps of Engineers, U. S. Army. A test section of hose, installed by Army engineers on the dredge Burgess, withstood the scouring effect of 60,000,000 yards of sand and river mud over a 6-year period before requiring replacement, according to a company statement.

Consisting of 15 plies of rubberized fabric and a coil of ⅞-inch copperized steel wire for reinforcement over a 1-inch tube of high-grade natural rubber, the finished hose units each weigh 8,080 pounds; their outside diameter at the nipples is 47 inches. These grandaddy hose will be installed on dustpan-type dredges that are working the Mississippi River.

Further information on dredge hose may be secured from the company. Or use the Request Card at page 16. Circle No. 52.

Truck-Mixer Rental For Large-Size Jobs

There's no need to make a heavy capital investment in concrete-hauling units, or to tax your service to regular customers for that one-time big job, according to the Conserco Co., River Road and B. & O. RR, Washington 16, D. C. For ten years, the company has made available to contractors north, south, and east a ready-mix concrete truck-mixer rental service so they could increase the size of their concrete operations for intermittent big-time jobs.

Conserco's fleet consists of International, Mack, and White heavy-duty tandem-drive trucks, all 1946 through 1949 models. Mounted on them are 3, 4, and 4½-cubic-yard high-discharge transit-mixers made by Jaeger, Ransome, Chain-Belt and Smith. The company points out that all units are guaranteed to be in excellent working condition, and that complete control over the equipment during the contract period is in the hands of the user.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 86.

Adjustable Wrenches

Two large-size alloy-steel drop-forged adjustable wrenches have recently been introduced by the Owatonna Tool Co., 381 N. Cedar St., Owatonna, Minn. These two wrenches adjust to 29 sizes. The smaller wrench, No. OA-24, is 24 inches long, ⅞ inch thick, and weighs 10 pounds. The larger wrench, No. OA-36, is 36 inches long, 1⅛ inches thick, and weighs 22 pounds. The smaller adjusts from 1⅜ to 2⅞ inches; the larger from 2 15/16 to 4¾ inches. These adjustable wrenches are designed to reduce the weight and bulk of the load which a service or maintenance man may have to carry.

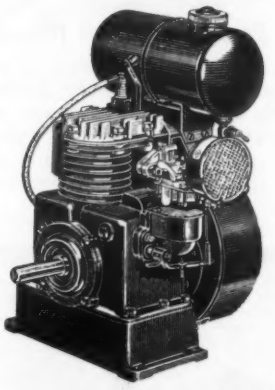
Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 134.

How to Run a Lathe

A 128-page text on the care and operation of screw-cutting lathes is available from the South Bend Lathe Works, 114 E. Madison St., South Bend 22, Ind. Titled "How to Run a Lathe", this book is designed to give the beginner or apprentice in the machine shop, and the student in the school shop, a better understanding of the operation of a modern screw-cutting engine lathe. In illustrating and describing modern lathe practice the authors of the text have tried to show only the best and most practical machine-shop practice. Cost of the booklet is 25 cents.

Eriez Promotes Roosevelt

R. A. Roosevelt replaces George R. Wellman, who has resigned, as Sales Manager of The Eriez Mfg. Co., Erie, Pa., manufacturer of magnetic separation equipment. He is also Advertising Manager of the company.



Model K7-1, 1½ H.P. 4-cycle, single cylinder, air-cooled. Length 13", width 14", height 17", Weight 38 lbs.

POWER FOR:
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Road Oilers
Conveyors
Compressors
Pumps
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And other uses.

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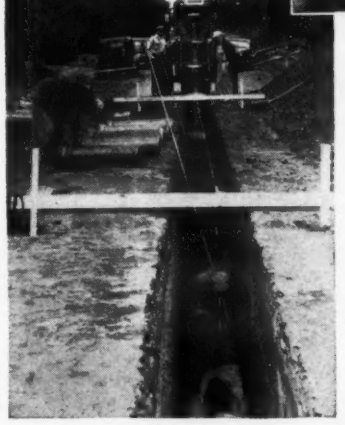

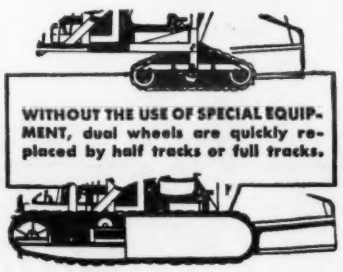

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25 MPH ROAD SPEED

Model 202 with rear dual wheels offers cost-cutting mobility of twenty-five MPH road speed. Eight MPH is recommended speed when unit is equipped with tracks or half tracks. All Badger units are easily transported on 1½ ton truck.

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C. R. TAYLOR & CO. P. O. Box 221 Garden City, Kan.

A 15-Mile Gravel Road Is Given Hard Surface

Prepared Base Is Primed, Then Topped With Three Surface Treatments; Will Serve U. S. Hospital at Carville, La.

✦ THE Louisiana Department of Highways has paved a 15-mile stretch of gravel road on State Route 63 south of Baton Rouge along the left, or east, bank of the Mississippi River. Work on the improvement began in October, 1948, after the state awarded a contract to the LeBlanc Brothers of Baton Rouge on the low bid of $252,056.07. By December of that year, the drainage and base-course operations were completed, and the project was shut down through the rainy winter. Construction got under way again in April, 1949, with the priming of the base course, followed by a triple bituminous surface treatment. The new black-top pavement was finished in June.

The job began just south of Burtville, at the Iberville parish line, and continued in a general southerly direction to the Ascension parish line just above Geismar. The original gravel road followed closely the ox-bow bends of the Mississippi along the land-side toe of the great river levee. Two of these giant loops were eliminated by cut-offs in the alignment of the relocated new road, just as the course of the river itself is often straightened. This shortens the distance between Baton Rouge and the closely spaced villages in the flat plantation area along the river road.

One of the major functions of this highway is to provide the means for easy access and transportation to the U. S. Marine Hospital at Carville, La., the only national leprosarium in continental United States. Carville lies along the river between Burtville and Geismar, and is served by a spur of the new road since it is on a cut-off at a river bend.

Several years ago, State Route 63 had been black-topped for a distance of approximately 4 miles below Baton Rouge. The remainder of the meandering 27 miles between the state capital and Carville was a rough-riding stretch of rutted, loosely filled gravel. There still remains an approximate 4½-mile section of old road, from the end of the original hard pavement to the start of the new project at Burtville, that was not included in this contract. This short gap is expected to be paved in the near future. When that final link is black-topped, the entire distance from Baton Rouge to Carville will have a hard all-weather surface. The recent improvement does pass through St. Gabriel which is on the Illinois Central railroad, the nearest rail connection to the hospital.

Drainage and Base

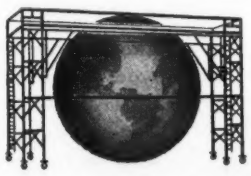
Construction in the fall of 1948 consisted of installing 18 and 24-inch reinforced-concrete cross-drain pipe under the old roadbed wherever necessary,

C. & E. M. Photo

At the Illinois Central RR siding at St. Gabriel a tank car of AC-8 asphaltic cement is heated by a Cleaver-Brooks tank-car heater and pumped into a Rosco distributor mounted on a Dodge truck.

and repairing three creosoted-timber bridges. The bridge work included new timber decks and hand rails, together with the installation of Resiliflex metal guardrails. At the same time road

(*Continued on next page*)



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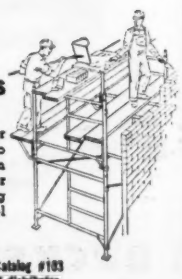

For getting up faster ... with no bolts to master, construction men the country over are now specifying Ezebilt Steel-Panel Scaffolding.

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- Loads big trucks
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Here is a new HOUGH PAYLOADER — a new size of PAYLOADER — that sets new standards of performance, usefulness and durability for ½ yard tractor shovels. It's got all the features and advantages that have made Payloaders top choice with contracting, industrial and public works buyers — an integral design of tractor and loader completely Hough-built, with a combination of traction, flotation, operating speed, maneuverability and over-all usefulness that opens new and wider fields of service for tractor shovels.

Your Hough Payloader Distributor is eager to put this brilliant performer through its paces for you. See him today or write . . . The Frank G. Hough Co., 762 Sunnyside Avenue, Libertyville, Illinois.

Send for catalogs on the new ½ yard HE Payloader or any others — the 12 cu. ft. HA, the ¾ yd. HF, the 1¼ yd. HL, or the big 4 wheel drive 1½ yd. HM.

HOUGH PAYLOADER
Manufactured by THE FRANK G. HOUGH CO.

C. & E. M. Photos

A Galion motor grader (left) shapes base course on Louisiana State Route 63, and a Minneapolis-Moline tractor (above) pulls a rubber-tire traffic roller over it.

A 15-Mile Gravel Road Is Given Hard Surface

(*Continued from preceding page*)

crews were preparing a new road base. The old road had a varying width of gravel which averaged around 24 feet without shoulders. The new road has a 20-foot bituminous surface-treated pavement on a 24-foot base, of which 21 feet were primed with asphalt. No grading was necessary since the land is flat, and the alignment of the road was retained with the exception of the two cut-offs.

The new base course is a combination of two materials—washed sand and gravel purchased from commercial pits, and silty loam dug out of the batture along the river side of the levee. Two companies—the Holloway Gravel Co., Inc., and Jahncke Service, Inc.—supplied the washed sand and gravel of which 60 to 75 per cent was retained on the No. 4 sieve. The material was shipped in gondola cars from pits near Baton Rouge to three sidings along the 15-mile project—at St. Gabriel, Burtville, and Bruns—all on the Illinois Central railroad.

At these locations the sand and gravel was unloaded by two Lima cranes equipped with 30-foot booms and ¾-yard clamshell buckets into a fleet of ten 5-yard trucks. The average haul to the job was 2½ miles. The trucks discharged their contents down one side of the road, and two Galion motor graders shaped the material into a windrow.

Prepared Base

The selected special binder material procured from the river batture was excavated by the Lima rigs working as draglines with 40-foot booms and ¾-yard buckets. Only about 20 per cent as much binder, or silty loam, was required as gravel in the preparation of the base course. Six 5-yard trucks hauled the binder up one side of the levee and down the other on dirt ramps dug into the side slopes. Three different pit locations were opened, and the average haul was 4 miles.

This selected material was shaped into a second windrow, also along the side of the road and right next to the first windrow of washed sand and gravel. The windrows were kept off to the side so as not to interfere with the movement of traffic which was maintained at all times. The only portions of the road which were closed were the cut-offs, and in such instances traffic used the old road alignment that followed the bends.

After the material in both windrows had been thoroughly mixed and blended by the two motor graders, the finished product was spread across the road and shaped. The base was rolled by two sets of rubber-tire traffic rollers drawn by Minneapolis-Moline rubber-tired tractors. It was kept wet by constant sprinkling from two tank trucks. The tanks carried 1,500 gallons of water and were mounted on Dodge trucks. The water was pumped from near-by bayous by a 3-inch pump and was distributed from a 12-foot gravity bar at

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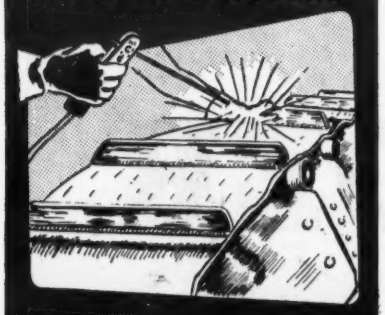
REBUILD
WORN
TRACTOR GROUSERS



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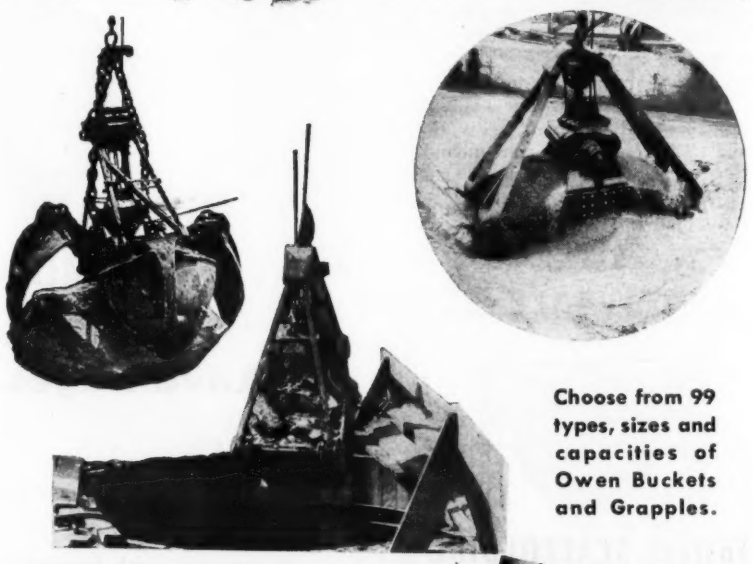

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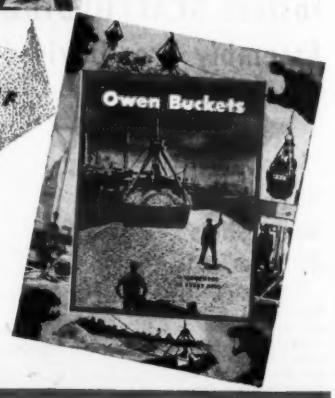

THE OWEN BUCKET CO.
4030 BREAKWATER AVE., CLEVELAND 2, OHIO
Branches
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A MOUTHFUL AT EVERY BITE

the rear of the trucks. The finished base is 24 feet in width, the same as the old road, and has an average depth of 6 inches. The original gravel served as a foundation.

Bituminous Work

Loose material was swept off the compacted base course by a Grace power broom pulled by one of the tractors. Then the center 21 feet of the 24-foot base was given a prime coat of P-I asphalt at the rate of 0.25 to 0.3 gallon to the square yard. All the bitumen used on the job came from the Pan American Petroleum Corp. at Destrehan, La., and was shipped in 10,000-gallon tank cars to the I. C. RR siding at St. Gabriel. The contents of the cars were heated by a couple of Cleaver-Brooks tank-car heaters and pumped out into two Rosco 1,250-gallon distributors mounted on Dodge trucks. The distributors applied the prime at temperatures between 100 and 125 degrees F.

The prime coat was allowed to cure for from 48 to 72 hours before the first of the three bituminous surface treatments was laid down. The second and third applications followed in close order behind the first treatment. The bitumen for the surface treatments was AC-8 asphalt cement with a penetration of from 150 to 200, and was applied between 275 and 350 degrees F. All applications were shot the full 20-foot width.

Each application was covered with a layer of uncrushed gravel supplied by the same firms which furnished the gravel for the base course. The cover aggregate was stockpiled at the Bruns and St. Gabriel sidings where it was loaded by a crane and clamshell into a fleet of eight trucks which hauled the material to the road. There it was spread on top of the bitumen by a Buckeye spreader hooked to the tailgates of the trucks. The gravel was spread in 10-foot lanes with the spreader box. In order not to delay traffic, only short stretches of bitumen were shot at a time, and these sections were covered at once with the aggregate. A drag broom with wire bristles was pulled over each layer of cover gravel by the rubber-tired tractor so as to obtain uniform coverage. Each course was then rolled by a Galion 5 to 7-ton tandem roller, after which traffic was permitted to pass over the work.

Applications and Gradations

The first bituminous surface treatment consisted of an application of 0.4 gallon to the square yard which was covered by size 1 gravel at the rate of 0.02 cubic yard per square yard. The second shot was 0.3 gallon per square yard followed by a cover coat of size 2 gravel spread 0.0111 cubic yard to every square yard. The last and top application was put on 0.2 gallon to the square yard, and topped by size 3 gravel at the rate of 0.0075 cubic yard per square yard. The size of the gravel decreases from the bottom to the top course. The gradation is given in the following tabulation:

Sieve Size	Per Cent Passing		
	Size 1	Size 2	Size 3
1½-inch	100	....	....
1-inch	85-100	....	....
¾-inch	40-80	....	....
⅜-inch	....	95-100	....
½-inch	0-15	90-100	100
⅜-inch	....	40-80	95-100
No. 4	....	0-15	40-70
No. 10	....	0-3	0-15
No. 16	....	....	0-5

Quantities and Personnel

The major items in the 15-mile blacktop contract included the following:

Reinforced-concrete pipe, 18 and 24-inch	1,260	lin. ft.
Washed sand and gravel	31,491	cu. yds.
Special binder	6,293	cu. yds.
Bituminous prime	49,350	gals.
Asphalt cement	161,422	gals.
Cover material, Size 1 gravel	3,588	cu. yds.
Cover material, Size 2 gravel	1,991	cu. yds.
Cover material, Size 3 gravel	1,345	cu. yds.

A work force averaging from 25 to 30 men was employed on the project by the LeBlanc Brothers under the direction of C. L. Daniel, Superintendent.

For the Louisiana Department of Highways, John A. Brown was Project Engineer. The work was located in District 6 of which C. J. Helbak is District Engineer with headquarters at Hammond. The Department is headed by R. B. Richardson, Director. N. E. Lant is Chief Engineer, and W. J. Hughes is Construction Engineer.

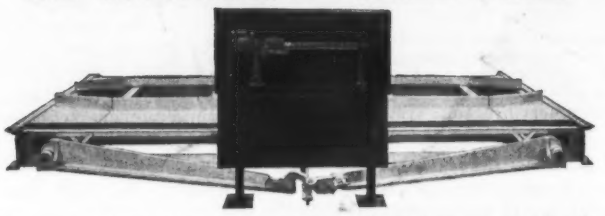
Cutting Repair Bills With Split Washers

Sabeco split thrust washers will reduce your repair bill and down-time, according to an announcement by the Saginaw Bearing Co., 821 S. Water St., Saginaw, Mich. For use on all types of machinery, the Sabeco split washers are designed to cut cost because they can be installed without dismantling the machine. When new bearings are to be installed, the split washers are simply slipped over the shaft and locked with a safety key. Made to order on individual specifications, the replacement split washers are made of Sabeco bronze, a combination of copper, tin, and lead with a maximum of 0.2 per cent impurities.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 59.

WINSLOW—PORTABLE TRUCK SCALE

"THE CONTRACTORS' SPECIAL SCALE"

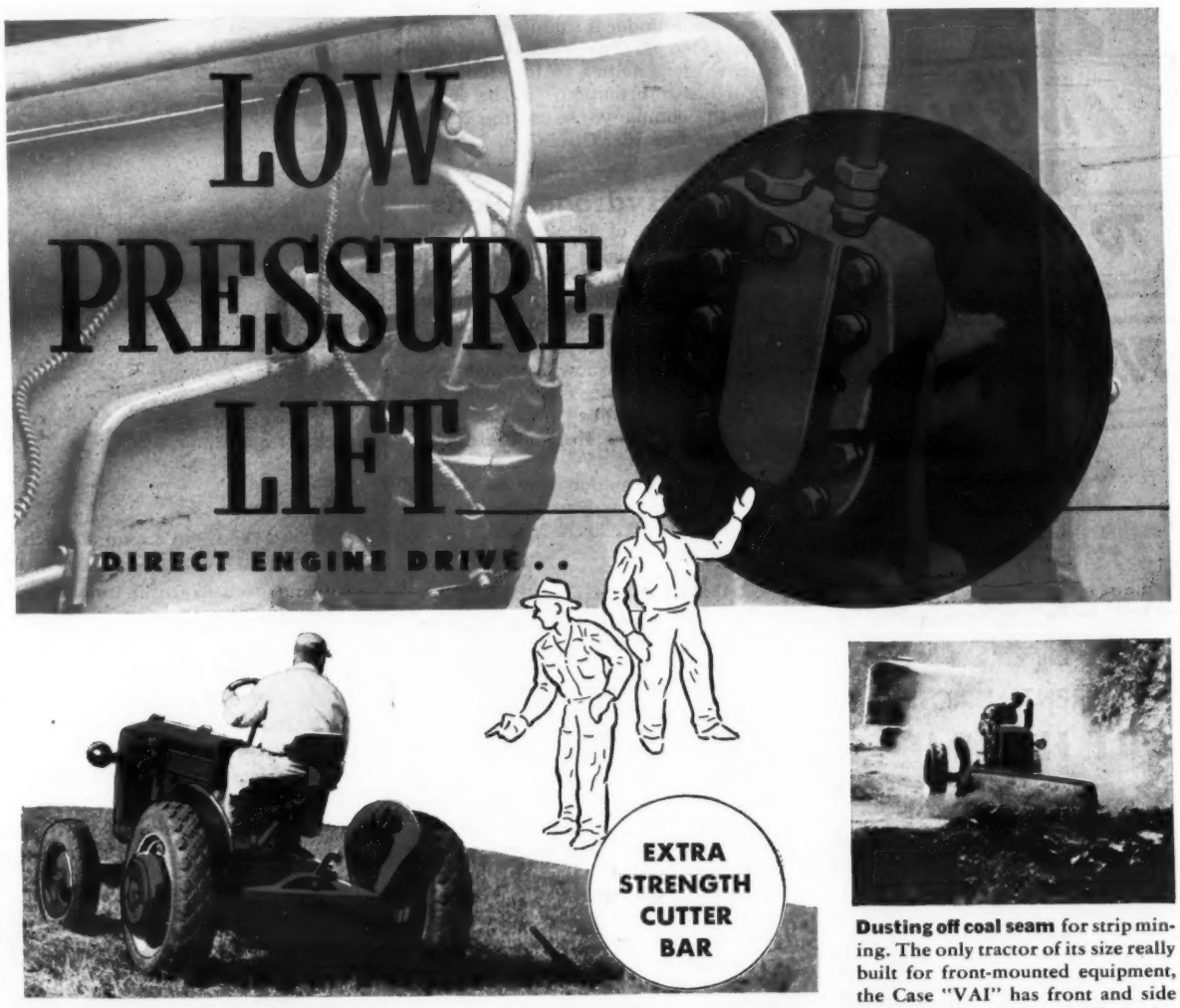


For use at temporary and permanent locations—at stock piles and by bituminous material contractors at the job site.

Capacities: 15-18-20-30 Ton—Write us for your nearest distributor

Mfd. by: WINSLOW SCALE COMPANY

P. O. Box 1198 Terre Haute, Indiana



Dusting off coal seam for strip mining. The only tractor of its size really built for front-mounted equipment, the Case "VAI" has front and side mounting faces with tapped holes for firm anchorage of brushes, plows, etc.

FAST • for Mower and Sweeper
BIG • for Heavier Jobs

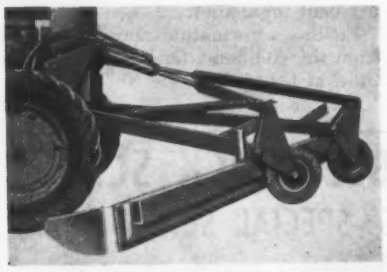
● You never need use clutch or gearshift . . . never delay a second . . . to work the hydraulic control on the Case "VAI" tractor. Driven direct from the timing gears, its simple, positive-acting pump keeps hydraulic power instantly available whenever the engine runs. Top working pressure is only about 800 pounds.

Full speed or standing still, it raises, lowers or holds the cutter-bar of the Case Highway Mower—famous for fast, clean work and for stamina in severe service. Rear wheels of the "VAI" can be set wide for still greater stability on steep slopes. With its heavy-duty, moderate-speed engine it's the big tractor in the 2500-pound class. J. I. Case Co., Racine, Wis.

Extra-strong front axle —regular equipment, not an extra on the "VAI"—takes in stride the added burdens of hydraulic loaders, dozers, snowplows. Flexible, unfaltering engine power takes hold of loads quickly, speeds up stop-and-go jobs.

CASE
INDUSTRIAL TRACTORS

Your Case industrial dealer invites you to inspect his convenient location, competent staff, and modern service facilities. He offers Case tractors in four basic sizes from 2500 to more than 10,000 pounds . . .Case highway and airport mowers . . . complete engine units in four sizes from 24 to 61 H.P. He also offers related equipment such as tractor-mounted loaders, sweepers, snowplows, scrapers and bulldozers—all selected to suit the characteristics of Case tractors and the operating conditions that prevail in your area. He will gladly give you the benefit of his broad experience in power and equipment applications similar to yours.



The Tractomotive windrow eliminator mounts on the frame of Allis-Chalmers Model D motor graders by four heavy bolts and two 1½-inch pins. It operates off the grader hydraulic system.

Windrow Eliminator

Another accessory for use with Allis-Chalmers Model D motor graders is a hydraulically controlled windrow eliminator manufacturer by the Tractomotive Corp., of Deerfield, Ill. On shoulder maintenance jobs, the windrow eliminator, or trailing blade, clears off excess material which the grader moldboard has piled up along the edge of the road. Time-saving and cost-cutting, according to the manufacturer, this attachment reconditions road shoulders in one pass, eliminates extra trips, and improves traffic conditions because windrows are immediately feathered out under accurate regulation.

Control is constant because the eliminator rides on its own wheels and blade settings are not affected by up and down movement of the grader. The unit is mounted on the grader frame by four heavy bolts and two 1½-inch pins. It operates off the grader hydraulic system and can easily be raised and lowered to suit manueuvering requirements.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 111.

Load Binding Device

Difficult moving jobs and load binding can be accomplished quickly and safely, by one man, with the Nolan load binder and puller jack, according to The Nolan Co., Bowerston, Ohio. Quickly set up and used in any position—upright, sideways, or upside down—with lever pull away from the load or toward it, the Nolan load binder is said to give positive action always. Two models are available, with capacities up to 5 tons.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 23.

Low-Hydrogen Rods

A new line of low-hydrogen electrodes is now being produced by the Welding Division of Harnischfeger Corp., 4400 W. National Ave., Milwaukee 14, Wis. There are 14 different types in this new series, covering all welding applications where low-hydrogen electrodes are desirable. The coatings were developed to produce deposits low in hydrogen, thereby eliminating the underbead cracking.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 53.

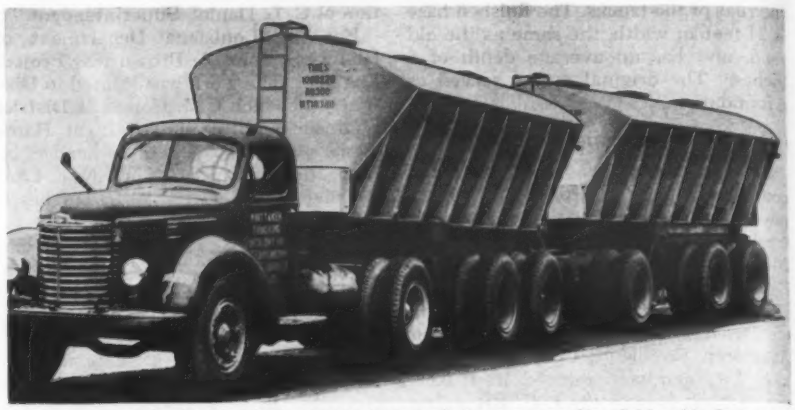
Bulk-Cement Bodies

The Baughman Hi-Speed self-unloading bulk-cement transports are custom-built to meet individual capacity and load requirements, according to an announcement by the Baughman Mfg. Co., Inc., Jerseyville, Ill. The TST-10 cement-transport bodies, available in 15 to 33-foot lengths, are constructed of 13-gage high-tensile alloy steel, with 11-gage sills, for least possible dead weight. The self-supporting waterproof roof, with an 18-inch crown of 20-gage checkered steel, has a rough catwalk top. There is a climbing ladder at the front of the unit. The 18 x 24-inch waterproof manholes are evenly spaced for capacity loading; their hinged tops seal by clamping with a wing nut which is made so it cannot be lost. The body unit is electro-welded.

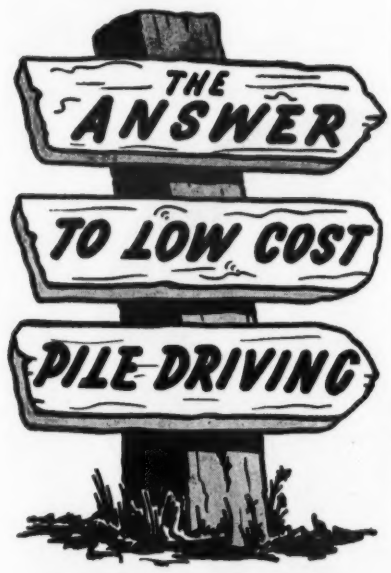
The Baughman transports are designed for twin-screw unloading. Air cells cover the double 9-inch heavy-duty screw conveyors for easy starting and fast discharge of material, the company says. Single or double outlets are equipped with rubberized-cloth boots which are watertight when closed. The chain-and-sprocket drive is completely enclosed. High-quality grease-sealed bearings are used throughout. All controls for the screws are outside the body. The power unit is mounted in the trailer frame under the center of the body, protected by splash aprons.

The Baughman transport has a body width of approximately 96 inches and can be built to any height. Capacity of the standard unit, without sideboards, is 24 cubic feet per linear foot of body.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 143.



Baughman self-unloading bulk-cement transports have a capacity of 24 cubic feet per linear foot of body. They are 96 inches wide and can be built to any height.



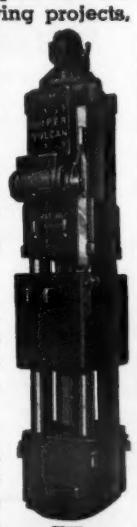
SUPER-VULCAN
OPEN TYPE
DIFFERENTIAL-ACTING
PILE HAMMERS
18C, 30C, 50C and 80C

In any season of the year for the most extensive pile driving projects, the SUPER - VULCAN demonstrates its ability to get jobs done speedily—with greater ease, and at less cost.

It's the sure hardhitting blow that counts and the SUPER-VULCAN gives you twice the blows per minute.

Rugged strength—simple design—positive action — durability — compactness are all important features.

The open type fits the same leads and uses the same accessories as the Vulcan Single-Acting Pile Hammer.



Sizes 18C—30C—50C—80C meet all needs

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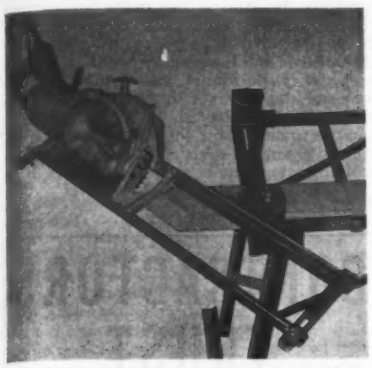
● You don't send a beach out to the cleaners. But take a look at this beach being dry cleaned. With Waukesha power! The top layer of sand, to a depth of nine inches, is being scooped up and screened . . . broken glass and other dangerous debris removed and articles of value recovered . . . and the clean sand, fluffed and aerated, is being replaced—by the *Beach Sanitizer* built by Sanitized Beaches, Inc.—a division of Stephens-Adamson Mfg. Co., Aurora, Ill. Powered by its Waukesha XAHU Gasoline Power Unit—4-cyl., 3⅝-in. x 4½-in., 186 cu. in. displacement; 43 hp. max. at 2000 rpm.—the *Beach Sanitizer* cleans a 6½-ft. wide strip of beach at a speed up to 1½ m.p.h., handling 2000-3500 sq. yds. of sand an hour. For details of this and other Waukesha Industrial Power Units, 8 hp. to 400 hp., send for Bulletin 1408.

WAUKESHA MOTOR COMPANY, WAUKESHA, WIS., NEW YORK, TULSA, LOS ANGELES

WAUKESHA POWER



You can do ripping, cross-cutting, and mitering with your portable power saw mounted on the Uniboy saw table.

Multi-Duty Saw Table

Have you ever wanted one table that would enable you to do ripping, cross-cutting, and mitering with your portable power saw? The Sales Service Machine Tool Co., 2363 University Ave., St. Paul 4, Minn., says that its Uniboy saw table meets just this need. Weighing 75 pounds, the Uniboy can be folded and tucked away in your car trunk in a few minutes, or opened and set up to do almost any type of sawing job. With the hand power saw mounted in position, the operator is ready to make a cross cut, bevel cross cut, miter cross cut, compound miter, rip, or bevel rip cut with equal ease.

The Uniboy saw table has an overall length of 84 inches, width of 30 inches, and height of 34 inches. The cross-cut capacity of the table is 2 x 12 inches. The 45-degree miter-cross-cut capacity is 2 x 8 inches.

Further information on this saw table may be secured from the company. Or use the Request Card at page 16. Circle No. 124.

Circular on Jaw Crushers

A circular describing McLanahan jaw crushers for primary and secondary work has recently been issued by the McLanahan & Stone Corp., McLanahan Bldg., Hollidaysburg, Pa. Catalog JC48 describes seven of the crushers, explaining all design and construction features of their component parts. It includes a chart listing specifications, horsepower ratings, and approximate capacities for various sizes of stone.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 87.

Reproduces Drawings Without a Negative

The conventional negative step used in making cloth reproductions of engineering drawings can be eliminated by the use of Kodagraph Autopositive Cloth, a new photosensitized cloth developed by the Eastman Kodak Co., Rochester 4, N. Y.

Like other Autopositive materials, this cloth produces a positive copy directly from a positive original drawing. It may be handled in normal room light and is exposed on conventional blueprint or direct-process machines or a vacuum printing frame. Not only does elimination of the negative result in savings in time and materials, it also produces a cloth reproduction free from the distortion introduced by the use of paper negatives.

The new cloth is highly translucent to assure rapid production of quantity shop prints, and may be drawn in on either side with ink or pencil. It is available in 30 and 100-foot rolls in the following widths: 20, 30, 36, and 42 inches.

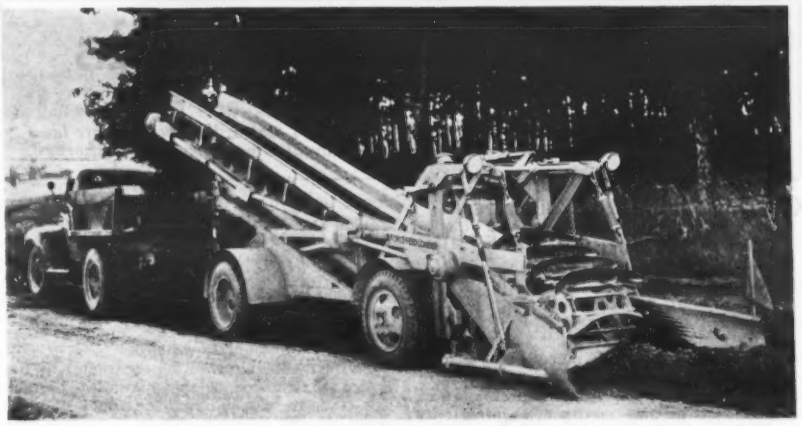
Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 36.

President of Engine Institute

Philip A. Norton, Sales Manager of the Wisconsin Motor Corp., Milwaukee, was elected President of the Internal Combustion Engine Institute for 1950 at a recent meeting of the institute in Chicago. He succeeds H. W. Smith, Manager of Engine Sales for the Caterpillar Tractor Co.

Loader Fleet Serves State

The State of North Carolina recently took delivery on 20 Force-Feed Loaders shipped by train from the Chicago factory of Athey Products Corp. The State bought its first Force-Feed Loader in 1945, and four more in 1946, to study and test its efficiency on all types of loading work in connection with road maintenance. The current fleet is now serving the Highway Department on a year-round basis, loading windrow material, ditch trimmings, broken pavement, topsoil, oil mix, gravel, leaves, and snow.



An Athey Force-Feed Loader helps maintain a North Carolina road. The State recently purchased 20 of these units.

WODACK "DO-ALL"
THE MOST USEFUL ELECTRIC HAMMER
MADE IN COMBINATION WITH AN ELECTRIC DRILL

UNEQUALED AS TIME AND LABOR SAVER

It's an electric hammer for concrete. ● *It's an electric drill for wood and metals.*

Hammers holes in concrete . . . vibrates concrete forms . . . cleans mortar from old bricks . . . grooves and roughs concrete . . . also drills steel and wood.

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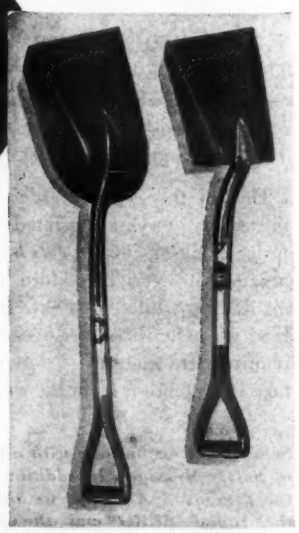
INGERSOLL SHOVELS
...Edges won't split or curl!

We guarantee this if you make sure to specify . . . INGERSOLL SHOVELS



The Special Tillage Steel, known as TEM-CROSS, used in the manufacture of all Ingersoll Shovels, was developed in our own steel mills. By cross-rolling and special heat-treating, we give this steel an interlocking, mesh-grain structure that resists splitting.

All Blade Finishes remain Black finish, except Shovels and Spades in Alloy, A and B Grades, which may be furnished with face polished and velvet back, or full polished.

Inquiries are invited
INGERSOLL STEEL DIVISION
Borg-Warner Corporation
New Castle, Indiana

INGERSOLL SHOVELS
"A Borg-Warner Product"

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Heltzel BUILDS IT BETTER
SUPERIOR CURB & GUTTER *Forms*

Demand for Heltzel forms comes from experienced contractors who know Heltzel forms save time and money. TIME — because firmer installations can be made faster. MONEY — because Heltzel equipment lasts longer and involves less labor on the job. The example below of a flexible form is typical of Heltzel better built forms.

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- COMBINED CURB & GUTTER
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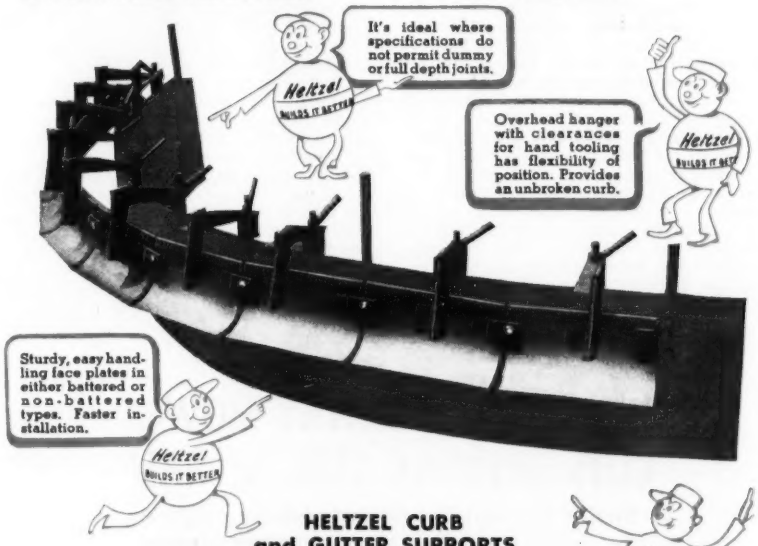
- RIGID RADIUS FORMS
- FLEXIBLE FORMS
- SPECIAL FORMS


It's ideal where specifications do not permit dummy or full depth joints.
Overhead hanger with clearances for hand tooling has flexibility of position. Provides an unbroken curb.
Sturdy, easy handling face plates in either battered or non-battered types. Faster installation.
Heltzel BUILDS IT BETTER

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The only flexible form with three alternate methods of support — (1) Full depth division plates, (2) Skeleton division plates, and (3) Overhead hangers. All Heltzel forms improve contractors' operations, because they speed up job while making the work easier.

PUT HELTZEL TO WORK MAKING MONEY FOR YOU

Before you buy, before you start a job — check with Heltzel! Heltzel better built curb and gutter forms in standard types will save for you. Special shapes designed by Heltzel to job specifications make difficult jobs click like run-of-mine work. Write for information now.

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Please send information regarding:
CURB and GUTTER FORMS _____
ROAD and AIRPORT FORMS _____
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Firm _____
Address _____
City _____ State _____
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HELTZEL STEEL FORM & IRON CO. WARREN, OHIO · U. S. A.

Avoid Legal Pitfalls

Edited by A. L. H. STREET, Attorney-at-Law

These brief abstracts of court decisions may aid you. Local ordinances or state laws may alter conditions in your community. If in doubt consult your own attorney.

Owner Misrepresents Rock Available for a Dike Job

THE PROBLEM: *The Government required the contractor on a rock-fill dike job to secure the necessary rock from a certain butte which was represented to be a "solid rock formation". The contract required that 90 per cent of the rock placed in the dike range from ½ to 1 cubic yard in size. Did the Government impliedly represent that rock suited to the contract requirements would be obtainable from the butte without excessive waste? And was the contractor entitled to recover extra costs resulting from friable condition of the rock and resulting waste?*

THE ANSWER: Yes. But the contractor's acceptance of change orders during progress of the work, without reserving rights as to work already done, precluded claim for extra cost as to such work. On the other hand, the Government wrongfully reduced the unit price, although the change orders permitted use of quarry-run rock, abrogating the minimum-size provision. (Tobin Quarries, Inc., v. United States, 82 Fed. Supp. 512, decided by the United States Court of Claims.) Awarding judgement in favor of the contractor, the Court of Claims declared:

"When this contractor bid on the work, we think it had a right to assume that it would secure the requisite sizes of rock from this butte without waste. . . . Only 30 per cent of the rock in the quarry came up to the required sizes. . . .

"The Government's representations, therefore, were not correct, and the contractor was misled thereby. However, there is no proof that the Government knew at the time it made these representations that they were false; it was merely mistaken, and when it discovered that a mistake had been made and that the required sizes of rock could not be obtained without excessive waste, it amended its specifications three different times to meet the conditions as they developed. . . .

"Inasmuch as the conditions encountered differed materially from those which were supposed to exist and had been represented to exist, the contractor was entitled to an equitable adjustment. It was not only entitled to a modification of the specifications for work to be done from then on, but . . . to payment for the excess cost it had incurred by reason of running into conditions different from those represented and which it had a right to expect."

But the court decided that the contractor had waived his right to such an adjustment for work already done by agreeing to the terms of the change orders which were so worded as to relate only to work remaining to be done. The court said: "Although the contractor was entitled to an equitable adjustment for work already done, nevertheless the contract was modified only as to work to be done in the future, and it was expressly stated that all other terms and conditions of the contract were to remain the same, and this was accepted by the contractor. . . . If the contractor intended to insist on payment for rock excavated which did not come up to the required sizes, it should have accepted the change order reserving the right to do so."

So the award allowed the contractor by the court was limited to the amount by which the Government had reduced the unit price fixed by the contract. The ground for this award was thus stated by the court: "When Change Order 3 was issued permitting the contractor to use an estimated amount of 18,000 cubic yards of quarry-run rock, the unit price was reduced from $1.09 to 60 cents. When this change order was accepted, the contractor protested against this reduction. We think the reduction was unauthorized. That quarry-run rock had to be used as the result of the Government's mistake in thinking that rock of the specified sizes could be secured from the butte. Plaintiff could not be penalized for using smaller sized rock when the required sizes were not reasonably available, as the defendant had represented they would be."

Contract Abandonment Was Not Justifiable

THE PROBLEM: *A city reservoir construction contract specified a unit yardage price for embankment. Contrary to the supposition of the contracting parties, the loose rock excavated on the site was not sufficient to provide all material needed for facings and riprap for an inner slope. The contractor had to blast elsewhere at extra expense to secure the necessary additional loose rock. The city contended that this work was covered by the extra-work clause of the contract, defining extra work or material as that for which no definite price was fixed by the contract. Was the contractor justified in abandoning the job when the city refused to acquiesce in his contention that the contract entitled him to pay as for rock construction?*

THE ANSWER: No. (McKallip v. City of Altoona, 108 Atl. 408, decided by the Pennsylvania Supreme Court, May 21, 1919.) After reviewing the provisions of the contract at length, the Supreme Court said:

"The specifications were explicit in declaring a sufficient quantity of rock would be taken from the various excavations. This having failed, it had to be secured at a place . . . [not] mentioned in the agreement. . . . But it is clear that the quarrying and loading of the stone . . . [were] work and material that the contractor was required to furnish, for which no definite price per unit was fixed, and [which was] covered by the extra-work clause of the contract. The contractor, therefore, could not decline to proceed with the work."

Rejecting the contractor's claim that the job had been substantially completed and that the contractor was entitled at least to collect the reasonable value of the work done, the court added:

"The doctrine of substantial performance has no place here, as the reservoir was not in any sense completed until the facing and riprap were in place; a small part of the reservoir might be used, but not until that work was done."

The decision in this Pennsylvania case is to be compared with one rendered by the Rhode Island Supreme Court in the case of Di Biaso v. Ross, 110 Atl. 415, June 22, 1920. The plaintiff had contracted to excavate a cellar and construct a wall according to specifications, but the city refused to permit the work without a costly change of plans. The court decided that plaintiff contractor was justified in abandoning the contract, after owner's refusal to pay the extra cost, for, "The plaintiff did not voluntarily abandon the work required under his contract, but was prevented from proceeding with it by order of the assistant building inspector requiring a footing wall to be placed under the cement walls. The plaintiff endeavored to agree with the defendant upon a price for the new work required. . . . Failing to do this . . . the plaintiff was justified in abandoning the contract and bringing suit to recover the balance due him for work and materials furnished."

Validity of Cost-Plus Construction Contract

THE PROBLEM: *A municipal waterworks construction contract gave the contractor a fee equal to 15 per cent of the guaranteed estimate of construction cost plus additional compensation for use of machinery furnished by him. Was the contract void, and therefore subject to attack by taxpayers, on the ground that it was against public policy because it gave the contractor a dual interest in the contract and made him his own employer?*

THE ANSWER: No. (Findley v. Vidalia, 51 S. E. 2d 542, decided by the Georgia Court of Appeals.) The court said:

"The fact that the contractor received a fee of 15 per cent of the guaranteed estimate of the costs of the construction, with specified sums for the use of necessary machinery furnished by it, does not make the contract void as against public policy. The agency in the contractor with respect to the purchasing of materials and the employment of labor and supervisory personnel was limited by the terms of the contract in such manner as to bind the contractor to the plans, specifications, estimates, and costs set forth therein. Even if some provisions of the contract standing alone may seem to subject it to

(*Concluded on next page*)

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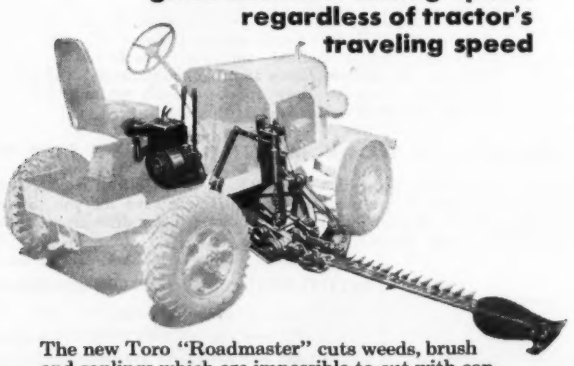

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the attack that the contractor was his own employer, we do not think the contract as a whole is properly capable of such construction."

Sales-Tax Exemption On Meals in Work Camps

THE PROBLEM: *Prior to 1943, California statutes provided that employers "serving meals exclusively to employees shall not be regarded as retailers of the meals served by them." In 1943 the law was changed so as to exempt from sales tax meals served by employers "to the employees engaged in work upon a particular project or undertaking." Could the amendment be regarded as interpreting the old law as having exempted from sales tax meals served by a prime contractor to both his own employees and those of subcontractors?*

THE ANSWER: No. Meals served by the prime contractor to both his own employees and those of subcontractors, before the law was amended, were not exempt. (Twaits v. State Board of Equalization, 210 Pac. 2d 40, decided by the California District Court of Appeal.)

The court said that in enacting the old statute, the Legislature was "of course, aware that in all large projects there were subcontractors and employees of subcontractors. If it had intended to exempt . . . an employer serving meals not only to its own employees but also to the employees of its subcontractors, it could easily have said so." But the new law manifested clear intent to extend the exemption to include employers serving meals to all employees working on a particular project.

The Effect of Trade Customs On Formation of Contracts

THE PROBLEM: *Ordinarily, an offer and its acceptance constitute a binding contract, without the formality of a contract signed by both parties—unless, as in the case of most important prime construction contracts, execution of a formal contract after acceptance of a bid is contemplated. But very often subcontracts exist through the mere acceptance of a bid. Where there is no explicit undertsanding that a formal contract is to be entered into, it may be inferred sometimes that the parties negotiated in mutual contemplation of a trade custom.*

In a recent Illinois case, a terrazzo subcontractor sought to avoid being bound by an acceptance of his bid by a general contractor. He insisted that there was a local custom among terrazzo contractors under which general contractors were required to submit formal subcontracts to subcontractors for signature. Did the subcontractor establish the existence of a binding custom in this regard?

THE ANSWER: No. (Traff v. Fabro, 84 N. E. 2d 874, decided by the Illinois Appellate Court, First District.)

The court applied the general rule that "a usage or custom to be binding must be so uniform, long-established, and generally acquiesced in, and so well known as to induce the belief that the parties contracted with reference to it, nothing appearing in their contract to the contrary."

The court said that the evidence offered by the subcontractor merely tended "to show that the association of terrazzo contractors attempted to establish a custom by its rules," without showing that plaintiff, the general contractor—apparently not a member of that association—"had knowledge of the . . . alleged usage or custom, nor does it appear that he had any prior transaction from which it might be inferred that he had such knowledge."

The court's decision that no formal contract was needed was in part based upon the fact that the plans and specifications, with respect to which the bid was made by the subcontractor, were sufficient to enable the subcontractor to perform his contract without further specification of details.

Concrete Mix Changed, Added Cost Allowable

THE PROBLEM: *A Government dam contract required that recesses in which metalwork was installed be filled with cement grout. The Government later required some recesses to be filled with concrete containing gravel, thereby increasing the cost of filling. Was the contractor entitled to an additional allowance?*

THE ANSWER: Yes. (Morrison-Knudsen Co. v. United States, 84 Fed. Supp. 282, decided by the United States Court of Claims.)

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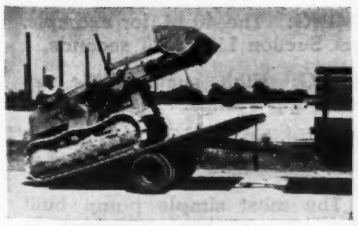

Above: ONE MAN easily loads an H D 9 crawler tractor on a Miller Model B Tilt Top.

Here are just a few of the features that make Model B a smooth operator in a rugged business. Model B frame is all welded, tapered channel steel engineered to give low fiber stress at areas of highly concentrated loads. The "straight through" axle welded into heavy steel tubing ties the main frame and gives a solid steel support from axle to platform. Dual wheel axle assembly is securely welded with alloy welding rods. Model B is on immediate delivery for only $975.00.

Optional equipment listed below is priced extra.
Hydraulic tilt control — Two Speed winch
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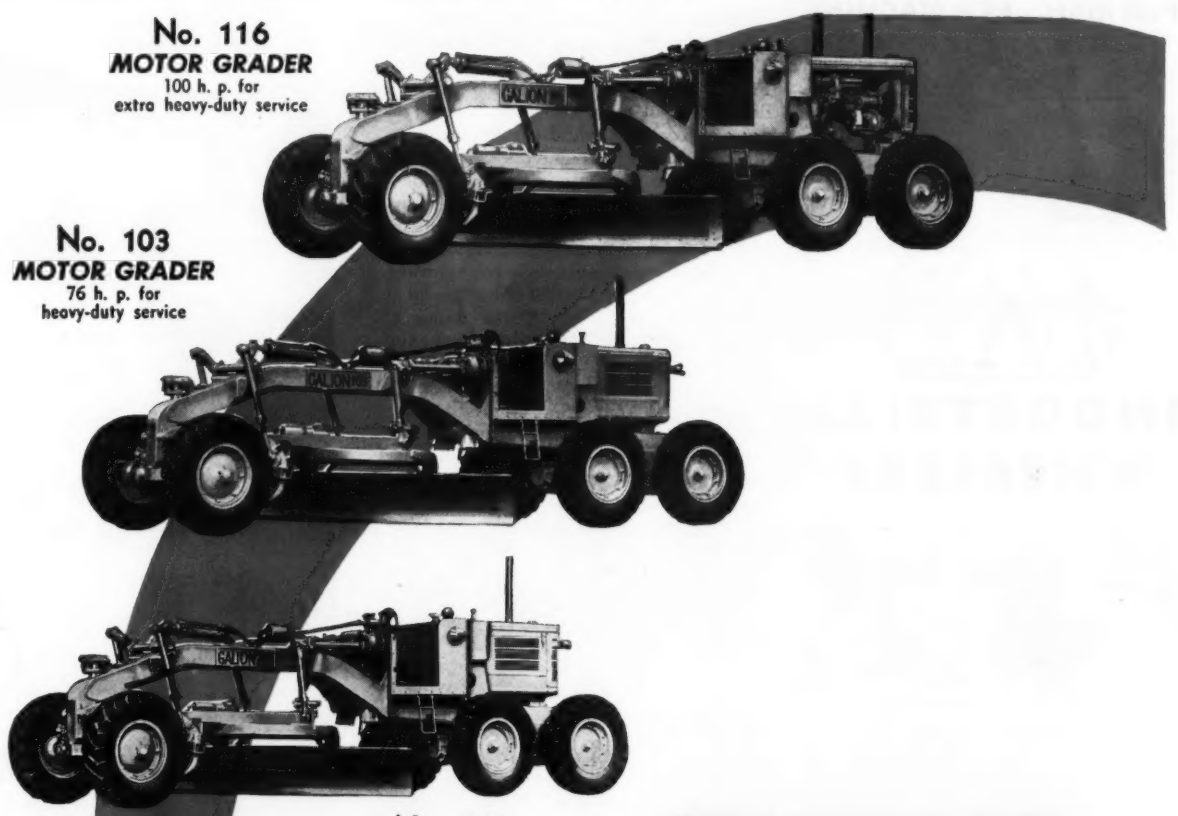

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STANDARD EQUIPMENT includes
Same size tires..... on front and rear.
Manual steering with hydraulic control.

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GRADERS · ROLLERS

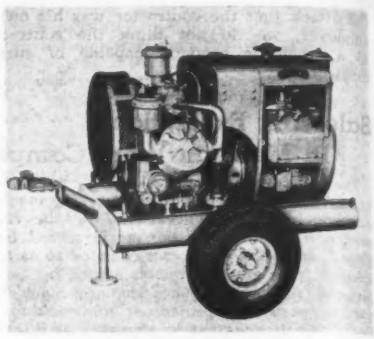
This D Roadster Tournapull loads itself in from 30 to 60 seconds on the Rhoten & Frysinger Construction Co. job in Wyandot and Crawford Counties, Ohio. The machine is used to finish subgrades, berms, and backslopes.

A 60-CFM Compressor

A new 60-cfm compressor, the Super Chief Model 60-WBD, is announced by the Davey Compressor Co., N. Water St., Kent, Ohio. A 3-cylinder air-cooled type, it employs stainless-steel disk Permanent Peak Efficiency valves, which are said never to carbon. Other compressor features include an automatic centrifugal clutch which engages at 700 rpm. This disengages the compressor when the engine is cranked and facilitates easy starting.

The unit has force-feed lubrication throughout by means of gear-driven pumps on both engine and compressor. Replaceable-element air and oil filters are employed. A built-in unloader system automatically maintains any predetermined air pressure up to 100 pounds. The compressor's 6-inch-diameter tubular steel frame serves as a 2,500-cubic-inch-capacity air receiver.

The Super Chief, with its tubular steel safety towbar and 6:00 x 9 balloon tires, can be towed at speeds up to 50 mph. Powered by a Model VP-4 4-cylinder air-cooled Wisconsin engine, the compressor is 72 inches long, 48 inches wide, and 52 inches high.



The Davey Super Chief Model 60-WBD compressor—a 60-cfm 3-cylinder air-cooled unit.

Further information on this compressor may be secured from the company. Or use the Request Card at page 16. Circle No. 110.

All Work, No Play For Tractor-Scraper

Rhoten & Frysinger Construction Co., Columbus, Ohio, drove its D Roadster Tournapull 100 miles from Cleveland to Findlay, Ohio, where it was used as a finishing tool on a subgrade job. In 13 working days it handled 3½ miles of berm, side ditches, and backslopes.

When the Findlay job was finished, the rig was transferred to the company's contract on Ohio State Highway 30N in Crawford and Wyandot Counties. This 10-mile subgrade job requires the movement of 178,000 cubic yards of topsoil, clay, and silt. Three Super C Tournapulls handle most of the heavy grading; the Roadster is used to finish subgrades, berms, and backslopes.

For back-sloping operations on this site, the machine makes thin cuts on 2 to 1, 3 to 1, and 4 to 1 slopes, picking up 5 yards in 100 to 150 feet. The loading and hauling operations are complicated by the necessity of maneuvering the Roadster around poles, culverts, and bridge abutments, and by the presence of other machines in the working area. In spite of these traffic conditions, the D averages a load every 5 minutes, it is reported.

Concrete-Vibrator Catalog

A new No. 50V Wyco concrete-vibrator catalog has recently been issued by Wyzenbeek & Staff, Inc., 835 W. Hubbard St., Chicago 22, Ill. Illustrated and described in the catalog are 1¾, 3, and 4-hp gasoline-engine vibrators and a 2-hp Universal electric vibrator. The vibrators are available with 10 or 7-foot flexible shaft sections, all interchangeable.

Also featured are two gasoline-engine grinders and one electric-motor-driven grinder. The folder points out that interchangeable and replaceable rubber-tipped vibrator heads are available. It describes also the Wyco wheelbarrow mounting for vibrators and the flexible shafts with nonmetallic inner-liners.

This literature may be obtained from the company. Or use the Request Card at page 16. Circle No. 148.

HOW TO DO MORE WORK PER MAN..PER MACHINE

MINNEAPOLIS-MOLINE MM MODERN MACHINERY

INDUSTRIAL WHEELERS

Greater speed and ease of handling make MM Industrial Wheelers the natural choice for economy handling of construction and maintenance jobs. A complete selection of attaching or pull type equipment provides a wide range of job application.

Save Time On The Job . . . On The Road . . . Deliver More Loads Per Hour.

The "shuttle gear" for fast reversing . . . "roller steering" that makes easier handling of any load . . . enable MM Industrial Wheelers to handle more loads per hour on loading and dozing jobs with less operator fatigue. New UTIL "shuttle gear" actually gives an operator a choice of *6 forward* and *6 reverse speeds*. Speeds up to 14.5 m.p.h. save time on the job as well as road time between jobs. The "straight-line" principal used in "shuttle gear" shifting eliminates slow gear shifting, doubles the time saved and makes possible extra loads per hour.

Original equipment manufacturers prefer MM Industrial Wheelers and Power Units for their economy, dependability and ease of servicing.

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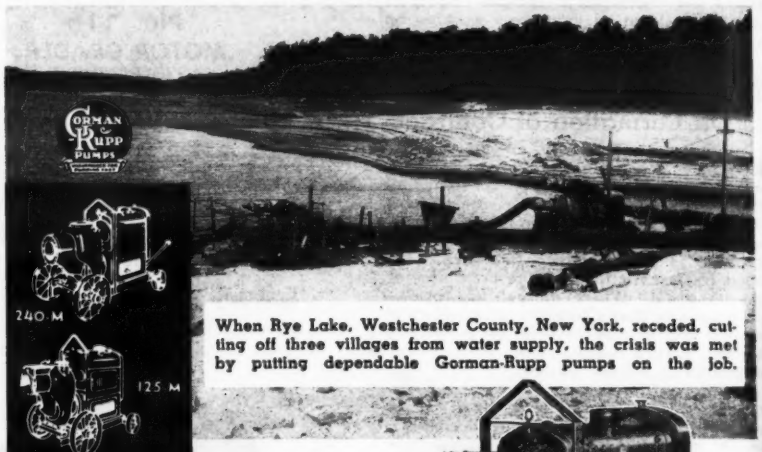
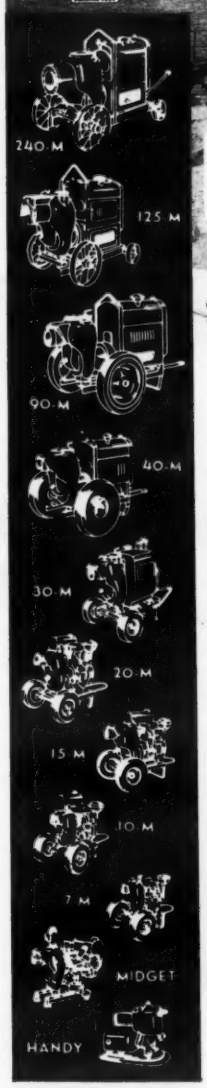
Gorman-Rupp's Handle Low Water Crisis at Rye Lake



When Rye Lake, Westchester County, New York, receded, cutting off three villages from water supply, the crisis was met by putting dependable Gorman-Rupp pumps on the job.



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Whatever the job requires: a tiny twenty pound "Handy" pump, a lightweight "Midget" pumping 5500 GPH, or a pump handling up to 240,000 GPH, you will find the most efficient pump is the Gorman-Rupp.

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HIGHEST PRIMING: High suction lifts are easy for Gorman-Rupp Pumps.

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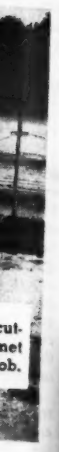

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The Continental tree mover handles trees with 50-inch-diameter balls and a weight up to 1½ tons.

Moves 1½-Ton Trees

Designed for handling trees with 50-inch-diameter balls and a weight up to 1½ tons, a new Continental tree mover for roadside development work is made by The DoAll Co., Des Plaines, Ill.

Its basic utility centers around the arrangement of its three-wheel suspension, its tilting boom, and adjustable tree-ball sling.

The frame is welded off-center to the boom and cradle so the unit can straddle the tree or hole. The front wheel swivels to give maximum mobility, and swings up out of the way during long hauls when hitched to a car or truck. Rubber tires cushion the load so that it can travel over newly graded areas without planks. Rear wheels are adjustable from 52 to 64-inches-wide tread.

The boom and cradle can be tilted as a single unit 30 degrees forward or backward by a ratchet lever jack. This positioning places the boom and its ratchet lever hoist directly over the tree to be moved. Large holes, runways, etc., are eliminated, the company points out. During transportation, holding rings on boom and cradle securely anchor the tree, and if the boom is tilted backward, the tree can pass under 8-foot archways, wires, and other overhanging obstacles. Boulders, pipe, septic tanks, etc., can also be handled by this tree mover.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 57.

L. I. Hewes of BPR Dies

Dr. Laurence Ilsey Hewes, Chief of the Western Regional Office of the Bureau of Public Roads, died suddenly in San Francisco on March 2. Employed in 1911 by the Bureau, he had been since 1920 in charge of Federal-Aid and national forest road construction in 11 western states, Alaska, and Hawaii.

Just before his death, Dr. Hewes spoke at the annual convention of the Associated General Contractors of America (see page 1 of this issue) on highway financing, a subject on which he was recognized as an authority. He was 74 years old.

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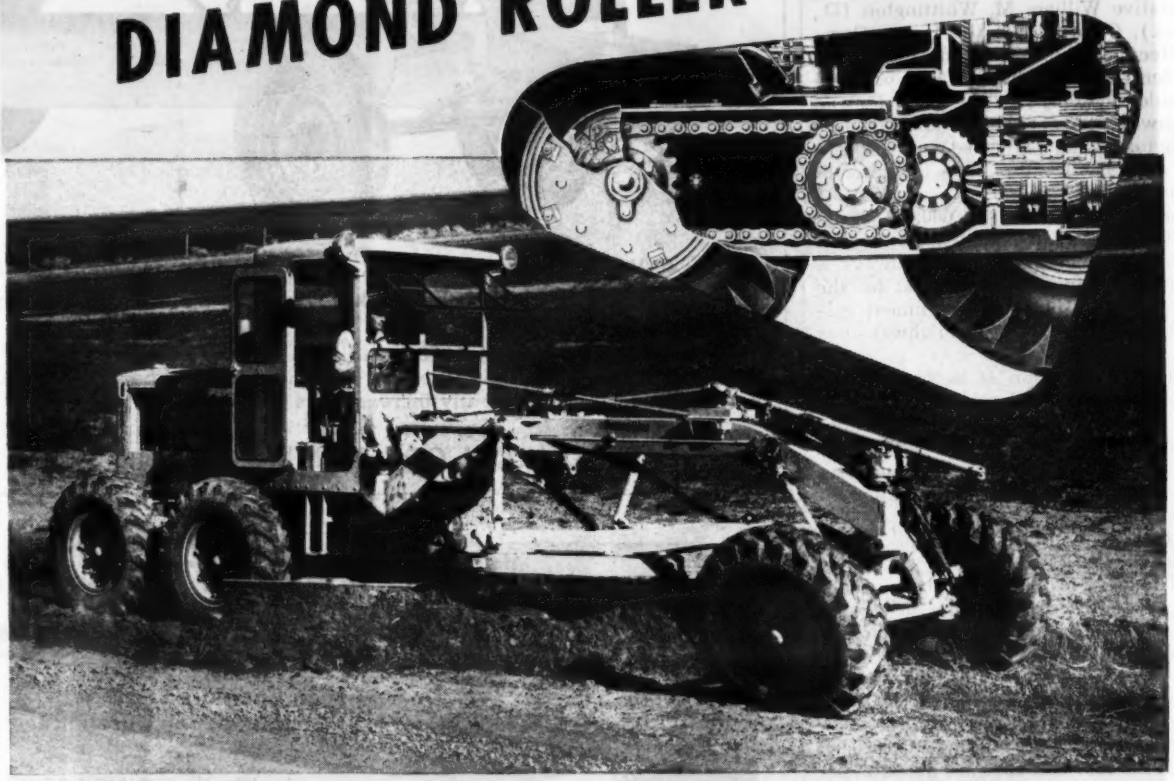

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Since the modernizing of road and construction machinery began, Diamond Roller Chains have given ample proof of their outstanding reserve strength, uniformity of quality, and long-life dependability.

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DIAMOND ROLLER CHAINS

Upham Out of ARBA As Engineer-Director

Retires at the 47th Annual Meeting; Delegates Urge More Federal Aid for Road Program Throughout the Country

✦ THE big news at the 47th Annual Meeting of the American Road Builders' Association, held last month in Cincinnati, Ohio, was the retirement of Charles M. Upham, long-time Engineer-Director of the national organization representing all phases of the highway construction industry, from that executive post. Upham, who is now 64, has been with ARBA since 1922.

A graduate of Tufts college in 1908, he has been in the road-building field ever since. At various times in his earlier career Upham has been Chief Engineer of two state highway commissions—Delaware and North Carolina. His successor is to be announced by the ARBA Board of Directors. For a period of years he will still be available as consultant to the ARBA.

More Federal Aid

The theme of the road builders' gathering emphasized the necessity of increasing the country's highway program by securing additional Federal-Aid funds to finance it. This keynote was struck at the first general assembly of the four-day convention when Representative William M. Whittington (D., Miss.), Chairman of the House Committee on Public Works, stated that the Federal-Aid Highway Act of 1950 should not only set the pace for the highway needs of the present, but provide for the highway needs of the future as well. The Congressman is author of a bill for $630,750,000 a year in Federal road aid, of which $570,000,000 would go to the states. He pointed out that the policy of Federal aid for highways is self-liquidating, and cited that for the fiscal year 1949, the Government collected $1,326,054,091 in highway-user taxes.

Rep. Whittington is in favor of an increase in the Federal contribution to the Interstate system from 50 to 75 per cent, which he says should be fixed for all the states. He also urged increases in funds, as soon as practicable, for controlled-access four-lane divided highways for miles from all larger urban areas.

The move for bigger and better highways was discussed further in a paper of Thomas H. MacDonald, Commissioner of Public Roads, and read by his assistant, Lawrence Tuttle. MacDonald was detained in Washington by Federal-Aid legislation hearings. He wrote that Federal funds totaling $450,000,000 each for 1950 and 1951 are available for road work. But the Commissioner questioned whether our roads will be as adequate 15 years from now as they are for today's traffic at the present rate of $1,750,000,000 expended on them in 1949.

He pointed out that the American Association of State Highway Officials "has found that an annual expenditure of well over $4,000,000,000 for the next 15 years is required to improve the condition of the nation's streets and highways to justifiable standards. This would include about $1,000,000,000 for maintenance, and $500,000,000 for interest and retirement of highway debt now outstanding, and for highway administration".

DeWitt C. Greer, President of the AASHO, and State Highway Engineer of the Texas Highway Department, urged that the appropriation for Federal Aid be increased to $810,000,000 a year "to meet an impending crisis in highway transportation". He suggested that Federal financing be expanded to include four categories of highways—interstate system; primary Federal-Aid highways; secondary or farm-to-market roads; and urban thoroughfares. The AASHO head called attention to the nearly 44,000,000 motor vehicles registered in the country today, as compared with 32,000,000 in 1940, an increase of almost 37 per cent.

Technical Sessions

More than finance, however, was discussed at the road builders' convention. The parlors of the Netherlands Plaza Hotel, where the four-day meeting was held March 6 to 9, were given over to technical sessions on varied topics in the highway and airport fields. Subjects on the program included soils, base courses, pavement design and construction, maintenance, equipment, materials, education for highway engineering, the growing use of two-way radio in highway work, and administration. The papers and panel discussions had something of interest for delegates at all levels—contractors; engineers; city, county, state, and Federal officials; and manufacturers of equipment and materials serving the highway and airport construction industry.

At one of these sessions Wilfred Owen, Brookings Institution economist and author of "Automotive Transportation", suggested the creation of an industry-wide board of directors embracing the automobile, petroleum, tire, and other interests in the highway transportation field. Such a board, Owen indicated, would provide the overall direction needed to assure overall objectives. According to the economist, it would effectuate better balance between expenditures on road construction and motor-vehicle operating costs.

On the subject of finance Owen pointed out that airports to a large degree are financed by revenues from concessions, restaurants, newsstands, gasoline distribution, and the like. "On our highways, however", he continued, "those who derive their support from the traveled way not only fail to contribute to the provision of that facility, but actually destroy much of its value by interfering with the free flow of traffic. It is time we reversed this process and, in conjunction with limited-access design, make adequate allowances for the public to recoup some of the value its highway tax money creates by leasing roadside facilities to private industry."

Pan American Division

The meeting took on an international aspect at the sessions of the Pan American Division of ARBA. Among those

(*Concluded on next page*)

The "HUSKY" All-Purpose Road Grader, Maintainer, Ditcher and Terracer

With or without Front End Control and/or Off-Set Hitch or with Hydraulic Controls if desired.

With a 40 H.P. wheeled tractor it will completely ditch and grade a mile of normal town road per day.

It does so much and such better work it is hard to believe until you try it out. Unexcelled for contractors—leveling off and maintaining.

So strong all parts, except tires, guaranteed against breakage for one year regardless of how or why, and the wheels are over-tired to prevent skidding and washboarding. Much larger tires than recommended by tire companies but this greatly increases the efficiency.

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TERRAPAC
The Vibro-Plus TERRAPAC Soil-Compactor will give 95% compaction down to a depth of 3½ feet.

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- One man operation
- 2½ gallons of diesel fuel consumption per day

ROLLGEAR "INTERNAL VIBRATOR"
No Other Vibrator But Rollgear Has:

- High frequency (15,000) V.P.M.
- Flexible shaft speed of only 3600 R.P.M.
- A direct snap coupling between engine and shaft. NO TOOLS NEEDED
- 6 month guarantee

TOPDOG "EXTERNAL VIBRATOR"

- Lighter in weight with a heavier kick than ANY OTHER VIBRATOR
- Can save more than 75% of form costs
- 6 month guarantee
- Saving of a bag of cement per cubic yard of concrete
- Besides being used on all types of concrete forms, it can be used on chutes, vibrating tables, etc.

To insure a superior concrete product utilize Vibro-Plus equipment and know-how.

Consult us about your particular problem in vibration. A trained force will be at your disposal to assist you in every way.

DEALERS:
Your inquiries will receive prompt attention.

VIBRO-PLUS PRODUCTS, INC.
54-11 Queens Boulevard
Woodside, L. I. C., N. Y.
HAvemeyer 9-3115

attending were 21 engineers from 11 different Latin-American countries. Senator Dennis Chavez (D., N. Mex.), Chairman of the Senate Committee on Public Works, greeted the assemblage and discussed the Inter-American Highway which extends 3,200 miles from Laredo, Texas, to the Panama Canel. A report on the condition of the highway was presented by Tomas Guardia, Chief Engineer, Panama Section, of the Pan American Highway. The latter highway includes the Inter-American section of highway, also a section that extends from Colombia down the west coast of South America through Ecuador, Peru, and Chile. It is not completed as yet.

General R. A. Wheeler (ret.), Engineering Adviser to the International Bank for Reconstruction and Development, also addressed the Pan American group. The former Chief of Engineers, U. S. Army, stated that the International or World Bank can help the world, and Latin America in particular, along the hard road to economic development.

Bartlett Award

The George S. Bartlett Award, conferred annually by the ARBA on a person who has made "an outstanding contribution to highway progress", was presented to Minnesota Highway Commissioner M. J. Hoffmann. He has been with the Minnesota Highway Department since 1914 where he held various posts until appointed Commissioner in 1939. Since then Hoffmann has received reappointments from two succeeding governors.

The award took place at the annual banquet which was addressed by Senator Karl E. Mundt (R., S. Dak.). Another well known figure in the political world who spoke before a luncheon meeting of the convention was former Republican U. S. Representative from New Jersey, Fred A. Hartley, Jr., co-author of the Taft-Hartley law. Calling John L. Lewis "the number one oil-burner salesman of this nation", the retired Congressman asserted that the failure of President Truman to place the nation's welfare above partisan politics and apply the Taft-Hartley law encouraged the miners to defy the law in the recent coal crisis. Hartley emphasized that the labor law "is not intended to ruin the labor movement or to interfere with a single objective of labor. All it tries to do is to write equity into law, and to clear up abuses in the labor movement".

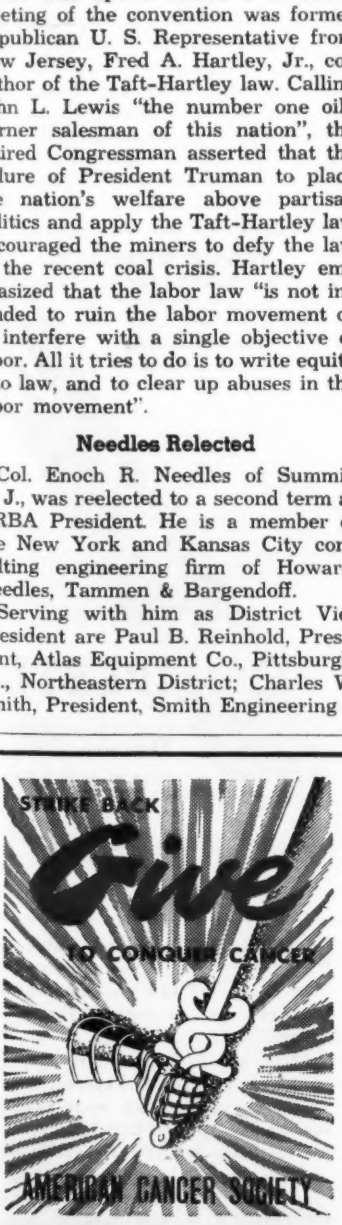
Needles Relected

Col. Enoch R. Needles of Summit, N. J., was reelected to a second term as ARBA President. He is a member of the New York and Kansas City consulting engineering firm of Howard, Needles, Tammen & Bargendoff.

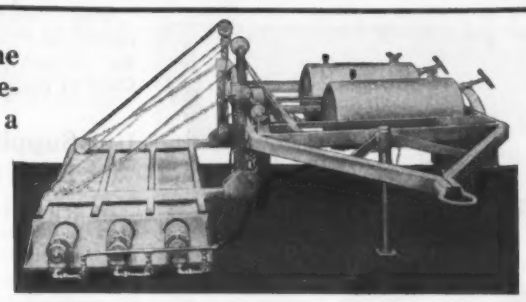
Serving with him as District Vice President are Paul B. Reinhold, President, Atlas Equipment Co., Pittsburgh, Pa., Northeastern District; Charles W. Smith, President, Smith Engineering & Construction Co., Pensacola, Fla., Southern District; W. A. Roberts, Executive Vice President, Allis-Chalmers Mfg. Co., Milwaukee, Wis., Central District; and T. E. Stanton, Materials and Research Engineer, California Department of Public Works, Sacramento, Calif., Western District.

Jennings Randolph, Assistant to the President of Capital Airlines, Inc., Washington, D. C., and former West Virginia Congressman, was renamed Treasurer. He was also installed as President of the Airport Division of ARBA.

Other ARBA division heads include: Contractors—Nello L. Teer, Jr., Vice President, Nello L. Teer Co., Durham, N. C.; County Highway Officials—Howard L. Way, County Commissioner, San Bernardino, Calif.; Municipal—H. H. Kranz, City Engineer, Cincinnati, Ohio; Educational — A. Diefendorf, Head, Department of Civil Engineering, University of Utah, Salt Lake City, Utah; Manufacturers—R. K. Stiles, Executive Vice President, Austin-Western Co., Aurora, Ill.



Why Destroy the Base of a Pavement to Apply a New Surface?



White Oil Burning Surface Heaters

These machines offer the quickest, cleanest, most economical method for repairing or resurfacing any bituminous pavement.

They melt 1" of old surface in 5 minutes. It can then be scraped away and new top applied without damaging the base course. This has been successful practice for many years.

Made in 2 sizes. Model B-4, illustrated, has 3 x 6' pan. Model B-1 has 6 x 6' pan, with 6 burners and is especially suited for large areas. They can be towed to the job and then moved by hand during operations. Plans have square cutting edges. Dual fuel tanks. Steel wheels, semi-elliptic springs.

Write for Catalog

ELKHART White Mfg. Co. INDIANA

State Highway Departments Handle More Material Faster WITH EAGLE LOADERS

3 TO 5 YARDS PER MINUTE

From stock pile to dump truck at a rate that can keep a fleet of trucks busy . . 28 fast moving buckets dump onto conveyorized discharge chute that swings in 180' arc. Especially useful in picking up windrow dirt or any loose material and snow.

ONE-MAN OPERATED

After loader is "on location" driver steps to running board where full hydraulic control of both loader and truck are within easy reach. Operator has best possible vision for safe, accurate, efficient operation of loader.

JOB-TO-JOB AT TRUCK SPEEDS

Speedy mobility is more important than ever—around the yard or from place to place. Means appreciable savings in total when you consider idle time of equipment and personnel. In many cases one quickly portable machine does the work of two or three less mobile units.

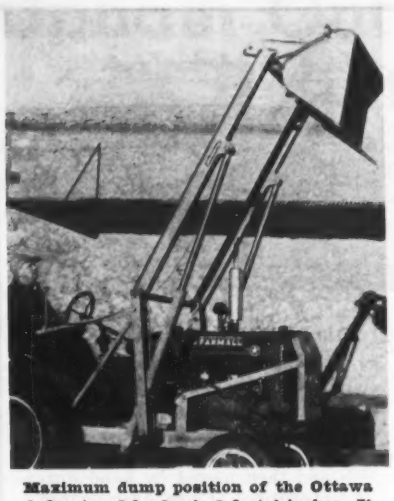
EAGLE ENGINEERING AND DEPENDABILITY CAN SAVE MANY DOLLARS FOR YOU

Write for Complete Specifications:

EAGLE

JAW CRUSHERS • IMPACT BREAKERS
PULVERIZERS • CONVEYORS • LOADERS

CRUSHER CO., *Inc.* GALION OHIO·U·S·A



Maximum dump position of the Ottawa A front-end loader is 8 feet 4 inches. It can center-load most dump trucks.

Front-End Loader

A new hydraulic front-end loader has recently been developed by Ottawa Steel Products, Inc., Ottawa, Kans., for use with the International Harvester A and Super A tractors. It lifts to a maximum dump position of 8 feet 4 inches, and because the fall of the material is 20 inches forward of the radiator grille guard, the unit can center-load most dump trucks. Designed for rapid work and easy handling, the Ottawa A loader may be used with a 7½ - cubic - foot - capacity material bucket, a 5-foot fixed-position light bulldozer blade, a 7-foot angling dozer-blade assembly, or an extra-large snow bucket. A one-lever fingertip control guides the 2-inch ram of the twin lifting cylinders.

Further information on this new loader may be secured from the company. Or use the Request Card at page 16. Circle No. 60.

Impact-Type Crushers

The Stedman impact-type single-cage reduction crushers made by the Stedman Foundry & Machine Co., Inc., Aurora, Ind., are designed to produce any size of material between ¼ inch and 3 inches. They can be used for primary reduction and secondary crushing depending upon the feed and size of the products desired. And they come in seven sizes capable of handling up to 7-inch feed.

The method of crushing is as follows: Materials are fed to the crusher through a large feed opening in the charging side. Dropping, the feed is struck a positive blow at right angles by fast-revolving impact pins in the cage, then again by material impinging on material. After the initial crushing, the particles pass through the openings between impact pins, being projected against the breaker plates in the cover and ends of the machine, so that there is a further reduction in particle size. Additional reduction occurs as the product, dropping from the breaker plates, is struck again by the stone passing through the impact pins and out of the cage.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 81.

Hard-Surfacing Electrodes

A folder describing Seaco ac-dc hard-surfacing welding electrodes has recently been prepared by Stulz-Sickles Co., 134 Lafayette St., Newark 5, N. J. The bulletin outlines the Seaco welding procedure for protecting hammers, crusher parts, shovel teeth and lips, bulldozer blades, and impellers against abrasion, and for armoring Manganal build-ups. The folder points out that the electrodes are available in standard 12-inch lengths and ¼ and 3/16-inch diameters. Features of the rods are also described.

This literature on Seaco hard-surfacing electrodes may be obtained from the company, or by using the Request Card at page 16. Circle No. 114.

Unit Supplies Spray Paint From Original Containers

An 8-page folder describing air-operated paint-supply pumps that enable the finishing materials to be fed directly from their original containers can be secured from the Gray Co., Inc., Graco Square, Minneapolis 13, Minn. Featuring the Graco Paintmaster, the catalog introduces a system for saving time in handling paint and improving paint applications. Paintmaster pumps are available for 5-gallon pails and 55-gallon drums. Both units fit over the original containers and pump directly from them. They are designed to maintain color density and retain the proper paint viscosity at all times.

Cutaway drawings and photographs illustrate the continuous agitation and circulating system which forces paint pigments to remain in constant suspension. The catalog carefully points out that an air-powered gear pump—not air pressure on the paint itself—is employed to move paint from the original container directly to the spray gun.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 44.

Highway Widening

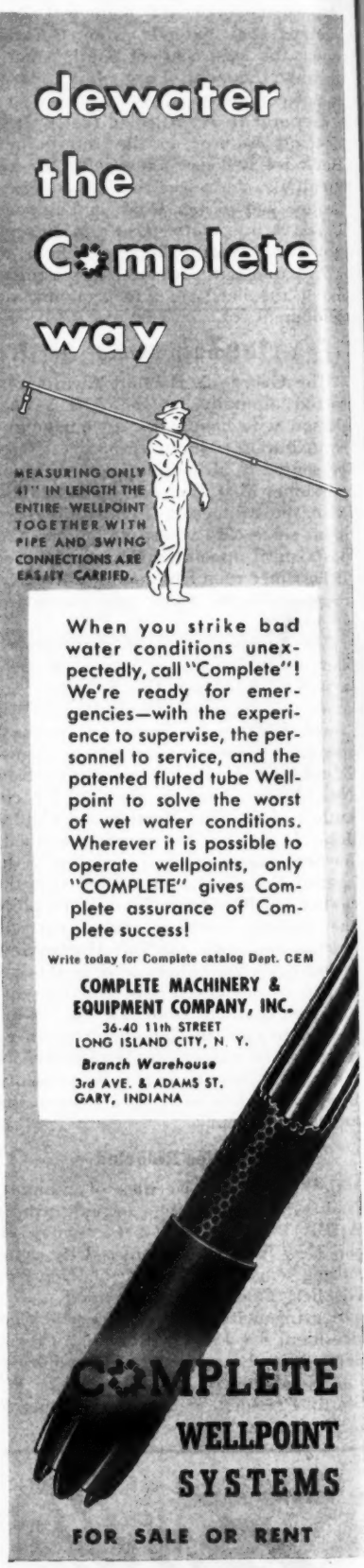
Widening existing roads for larger vehicles and greater speeds, and resurfacing existing roads for heavier traffic are discussed in Informational Bulletin No. 6 recently prepared by Macadam Pavements, Inc., 1018 Huntington Bank Bldg., Columbus 15, Ohio.

The bulletin states that widening and resurfacing improves a system seven times as fast as relocating and rebuilding, and further, that it spreads the work among many more small contractors. The bulletin points out that 333 miles of road can be widened and resurfaced for $10,000,000 whereas only 50 miles of new road can be built for the same sum. Drawings and photographs in the bulletin illustrate macadam-base widening and bituminous resurfacing operations.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 131.

LIGHTER
STRONGER
WELLMAN
Williams Type
BUCKETS
Stronger because they're constructed of welded rolled steel ... lighter because non-essential weight has been eliminated. Wellman buckets meet every requirement of heavy service with longer life and lower cost! A type for every service: Multiple Rope, Power Arm, Dragline, Power Wheel, Special Service. ⅜ to 16½ yd. capacity.
SEND FOR BULLETIN
THE WELLMAN ENGINEERING COMPANY
7012 CENTRAL AVENUE • CLEVELAND 4, OHIO

A ROGERS 'Tagalong' Trailer
AND YOUR DUMP TRUCK
...form a PROFIT-PRODUCING TEAM
Contractors everywhere are turning to the Rogers "Tagalong" for a bigger day's work with maximum economy.
One man can do all jobs. Load and unload trailer, connect and disconnect it; drive truck and operate equipment carried.
Ideal for light and medium shovels, cranes, bulldozers, etc.
Write for complete information.
Showing cable around sheave and dump body about to be raised to engage towing tongue.
Body elevated. Tightened cable has raised drawbar and engaged towing tongue. Safety coupling pin is inserted. Trailer is ready to roll when body is lowered.
ROGERS HEAVY DUTY Gooseneck Trailers
ROGERS BROTHERS CORPORATION
DESIGNERS and BUILDERS of HEAVY DUTY TRAILERS SINCE 1915
108 ORCHARD ST. ALBION, PENNA.


dewater the Complete way
MEASURING ONLY 41" IN LENGTH THE ENTIRE WELLPOINT TOGETHER WITH PIPE AND SWING CONNECTIONS ARE EASILY CARRIED.
When you strike bad water conditions unexpectedly, call "Complete"! We're ready for emergencies—with the experience to supervise, the personnel to service, and the patented fluted tube Wellpoint to solve the worst of wet water conditions. Wherever it is possible to operate wellpoints, only "COMPLETE" gives Complete assurance of Complete success!
Write today for Complete catalog Dept. CEM
COMPLETE MACHINERY & EQUIPMENT COMPANY, INC.
36-40 11th STREET
LONG ISLAND CITY, N. Y.
Branch Warehouse
3rd AVE. & ADAMS ST.
GARY, INDIANA
COMPLETE WELLPOINT SYSTEMS
FOR SALE OR RENT

MOVING? Be sure to give us 30 days' notice of your change of address—and let us have your old as well as you new address.

Unless you do this you may skip an issue or two before the correction is made—and you won't want to be missing any issues of CONTRACTORS & ENGINEERS MONTHLY these days!

CONTRACTORS AND ENGINEERS MONTHLY
470 Fourth Ave., New York 16, N.Y.

Distributor Doings

The Universal "University"

The sales organization, engineering staff, and management of Universal Engineering Corp., Cedar Rapids, Iowa, turned the company's plant into something resembling a university when they met for a 4-day intensive training course recently. The course covered every product in Universal's line and the manufacturing steps involved in its production. Field performance of the products was studied as were distributor problems and new developments. A short course in geology was given the salesmen to help them recommend correct crushing equipment for rock deposits.

The company used the school to train district sales representatives; to bring field reports to the attention of the management and engineering staffs; and increase service to distributors.

Shortly after the meeting, 150 distributors and their salesmen met at the Pettibone Mulliken Corp. plant in Chicago for a one-day sales meeting. Equipment valued in excess of $150,000 was displayed in operation.

An Exclusive for White Welding

White Welding Supply Co., St. Louis, Mo., is now exclusive representative for Hobart Brothers Co., of Troy, Ohio, in the sale of Hobart arc welders, electrodes, and accessories in metropolitan St. Louis and the surrounding Missouri and Illinois counties.

Berry Bros. Now Riddell Outlet

Texas sales and servicing of Warco motor graders and Hercules rollers are now directed by Sherman and Roscoe Berry, owners of Berry Bros. Machinery Co., Dallas, Texas. The company has six territorial salesmen and a service staff of mechanics, machinists, and welders. W. A. Riddell Corp., Bucyrus, Ohio, manufactures the Warco and Hercules lines.

Missouri-Illinois Increases Staff

Three new representatives have recently joined the Sales Department of Missouri-Illinois Tractor & Equipment Co., St. Louis. They are Stephen J. Pelentay, assigned to the Kirksville, Mo., area; William E. Cunningham, who will work out of the Charleston, Mo., area; and W. Dean Schott, assigned to St. Louis. The M.I.T. company now conducts sales, service, parts, and rental operations in St. Louis and Charleston, Mo., and Quincy, Ill.

Distributor for Concrete Cutters

Machinery Sales Co., 341 Blvd. of Allies, Pittsburgh, Pa., has been appointed a distributor for Cutcrete Corp., Pasadena, Calif., manufacturer of concrete cutters. H. C. Else heads the distributor company.

For Rosco in Alabama, California

Joe Money Machinery Co. of Alabama is now handling Rosco bituminous distributors, maintenance units, road and street brooms, tar kettles, etc., from its two sales and service plants—one at 903 Third Ave., W., Birmingham; the other at Mobile. Headquarters of the Rosco Mfg. Co. are in Minneapolis, Minn.

The Four Wheel Drive Pacific Co. of San Francisco has been appointed a Rosco distributor in California, north of San Luis Obispo, Kern, and San Bernardino counties. Officers of the company are O. E. Betow, President; R. L. Koehler, Vice President and Secretary; and J. E. Battes, Vice President and Treasurer. Al McPherson and Frank Crowley are sales representatives in Sacramento and San Francisco respectively.

New AED Executive Secretary

P. D. Hermann has succeeded Frank G. Knight as Executive Secretary of the Associated Equipment Distributors. Mr. Knight will become Executive Assistant in the Bemiss Equipment Corp., Richmond, Va. Mr. Hermann, who joined the AED Executive Office staff in March, 1948, has served during the past year as editor of the association's official monthly publication, *Construction Equipment News*. He was formerly

(*Concluded on next page*)

P. D. Hermann has succeeded Frank G. Knight as Executive Secretary of the Associated Equipment Distributors.

Pre-Molded *Para-Plastic*

CUTS COSTS . . . IMPROVES CONSTRUCTION

Premolded Para-Plastic Sealing Strips are the answer to tough joint sealing problems when an absolutely watertight seal is required and a hot-poured compound can't be used.

Use Premolded Para-Plastic Strips on vertical and overhead joints and keyways . . . for sealing expansion and contraction joints at the subgrade in highway construction for a perfect seal under all conditions at lowest labor and material cost.

Premolded Para-Plastic Sealing Strips are made for every joint sealing need. Write for illustrated catalog and complete information.

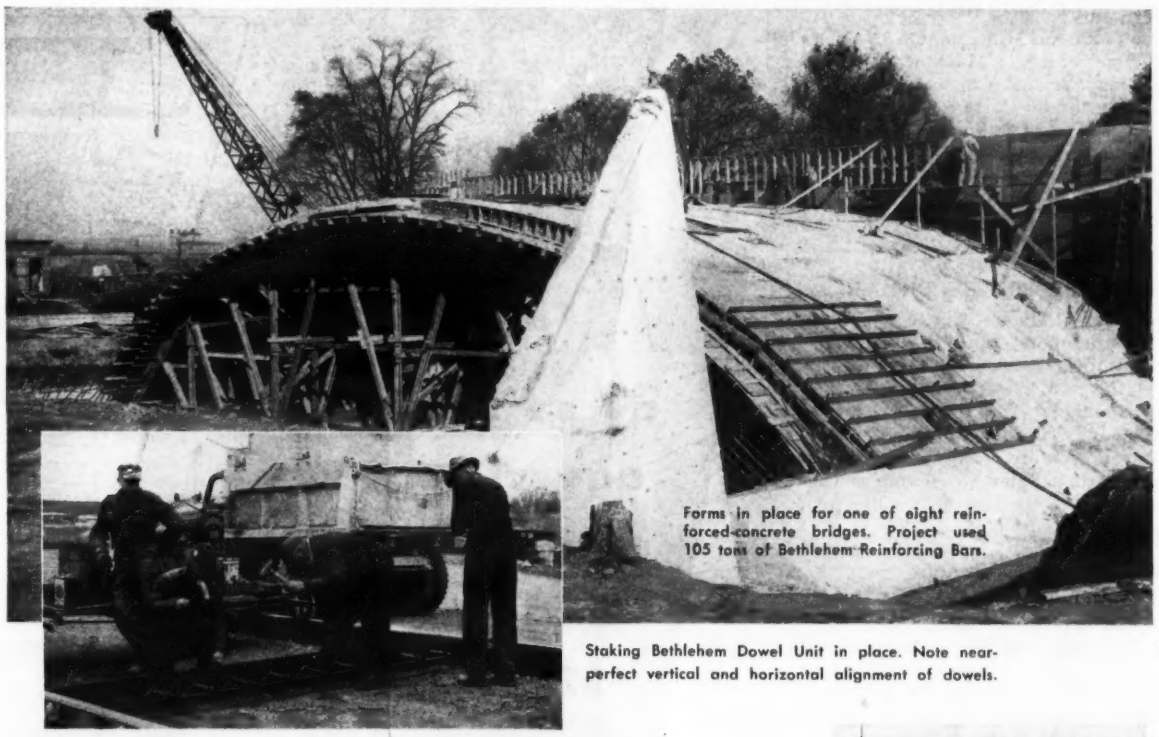
VERTICAL JOINTS

KEYED JOINTS

BASEAL for highway use

SERVICISED QUALITY PRODUCTS 1920

SERVICISED PRODUCTS CORP.
6051 W. 65th ST., CHICAGO 38, ILL.



Forms in place for one of eight reinforced-concrete bridges. Project used 105 tons of Bethlehem Reinforcing Bars.

Staking Bethlehem Dowel Unit in place. Note near-perfect vertical and horizontal alignment of dowels.

Cutting a New Path for U.S.230

To avoid congested areas, U. S. Route 230, heavily-traveled highway between Lancaster, Pa., and Harrisburg, was moved eastward recently in the vicinity of Mt. Joy. The construction photographs shown here were taken on a 25,000-ft section of the new four-lane road, built by John H. Swanger, Inc., Lancaster, Pa. Bridge reinforcing, dowel units, hook bolt dowels and keyway forms were supplied by Bethlehem.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation
Export Distributor: Bethlehem Steel Export Corporation

Top, right: Bethlehem Hook Bolt Dowels fitted into sleeve nuts in keyway. After forms are stripped, other hook bolts engage opposite ends of nuts, tieing slabs together. *Bottom:* Crane, with Bethlehem Wire Rope, at work in batching plant.

STEEL FOR HIGHWAYS

Dowel Units • Reinforcing Bars • Bar Mats • Guard Rail
Guard Rail Posts • Wire Rope and Strand • Pipe
Hollow Drill Steel • Spikes • Bolts and Nuts
Timber Bridge Hardware • Tie-Rods
Sheet- and H-Piling • Fabricated Structural Steel

BETHLEHEM STEEL

Left to right: D. Kehler and F. H. Grittinger, Pa. Dept. of Highways; J. Pfrommer, C. J. Wolf, and J. Feltman, of John H. Swanger, Inc.

Distributor Doings

(*Continued from preceding page*)

Assistant Director of the Public Relations Department of the Illinois Institute of Technology and its Armour Research Foundation.

Dealers Wanted for Pole Setter

Batavia Metal Products Corp., 350 Liberty St., Batavia, N. Y., announces that dealers are wanted for its new front-mounted pole-setting derricks: the Model FT for poles to 35 feet, and the Model XHM for poles to 75 feet. If you are interested write to Batavia.

Sales Representative Dies

Harry M. Vaughan, Sr., Sales Representative for the McIlhany Equipment Co., Inc., of Roanoke, W. Va., died recently from wounds received in a shotgun accident.

Norwes for Stow in Northwest

Stow Mfg. Co., Binghamton, N. Y., is now represented in Montana, northern Idaho, and Washington by the Norwes Co., 752 Dexter-Horton Bldg., Seattle 4, Wash. Norwes is handling the complete Stow line of Power Drive and truck pump shafts, concrete vibrators, and flexible shafts and machines. It is also servicing all distributors in the area.

Continental Splits Sales Division

Continental Motors, Muskegon, Mich., has separated its domestic and export distributor sales and service groups in order to gain closer cooperation between the factory and the field. Howard T. Conrey, a former Continental field sales representative, will manage the domestic distributor sales and service program. A. S. Bolthouse has the corresponding export post.

M-B Distributor in Virginia

Meili-Blumberg Corp., New Holstein, Wis., has appointed Phillips Machinery Co., Richmond, Va., its sales and service distributor in the state of Virginia. Phillips will handle the M-B power graders and maintainers and the complete line of M-B street, highway, and industrial markers.

Eriez Outlet in San Francisco

The O'Brien Industrial Equipment Co., 1295 Folsom St., San Francisco, which recently became a sales representative for the Eriez Mfg. Co., stocks virtually all types of Eriez magnetic separators. O'Brien has also made its engineering services available to Eriez customers without obligation.

To Handle Hard-Facing Alloys

The Elliott Sales Co., of Metzer, Oreg., has been appointed representative in the northwest by the Mir-O-Col Alloy Co., Inc., Los Angeles manufacturer of hard-facing alloys.

Rent, Sell Stud Welding Guns

Dealer franchises are being issued to established welding-equipment dealers under a new policy by the Nelson Stud Welding Division of Morton Gregory Corp. All 25 of the first dealers to whom franchises were issued will have stud welding guns available for rental by the day, week, or month, as well as for outright purchase. They will also carry standard parts and accessories.

Here are 20 Huber maintainers lined up in the Mechanicsburg, Pa., yards of American Equipment Co. They and ten others were recently sold to the State of Pennsylvania. All thirty came equipped with grader blades and highway mower attachments.

More Outlets for Bil-Jax

The three recent additions to the distributor organization of Bil-Jax, Inc., Archbold, Ohio, are Milwaukee Power Equipment Co., for Milwaukee and southeastern Wisconsin; Gopher Equipment Co., Minneapolis; and Standard Equipment Co., Wilkes-Barre, Pa., with branches in Harrisburg and other eastern Pennsylvania cities.

Additional dealerships are available for Bil-Jax tubular steel scaffolding. For information write to the company.

New Company Is Wire Rope Dealer

Great Lakes Splicing & Supply Co., 23570 Lakeland Blvd., Euclid, Ohio, a recently organized firm, is an authorized distributor for wire rope produced by American Steel & Wire Co., Cleveland, Ohio. James R. Bryant is President of the new company and David T. Hutton is Vice President and Treasurer.

Represents Republic Rubber, Texas

Briggs-Weaver Machinery Co., 300 S. Wayside Drive, Houston, Texas, will represent the Republic Rubber Division of Lee Rubber & Tire Corp., Youngstown, Ohio. It will make available to industrial users in the Houston area a complete stock of Republic belting, hose, and packing.

Over 350 companies are using display advertising this year in **CONTRACTORS AND ENGINEERS MONTHLY**, a total unmatched by any other monthly magazine in the field. Why do the majority of advertisers choose **C&E Monthly**? Summed up in one word the reason is "balance."

Balanced in circulation to cover the entire highway and heavy construction industry, **C&E Monthly** carries your sales message to all the important buying groups including: contractors, their superintendents, state and county highway engineers and commissioners, equipment distributors, specification engineers, major material producers, and others who influence and buy construction materials and equipment.

Balanced in editorial content to match the interests of the entire field, **C&E Monthly** presents practical articles (17 a month average) on highways, large buildings, excavations, bridges, tunnels, dams, and other types of heavy construction.

C&E Monthly Editors spend over two-thirds of their time on location, personally visiting construction projects, and talking with contractors and engineers. Their staff-written articles are built around the unending search of practical construction men for increased job efficiency and lower construction costs.

Balanced in advertising content through inclusion of over 170 manufacturers' sales messages in each issue. **C&E Monthly** is more useful to the reader as a purchasing guide than any other monthly publication.

Small wonder, then, that so many firms choose **C&E Monthly** as their "pivot publication" on which to build an advertising schedule according to their special needs. Small wonder too, that throughout the great construction industry there is a fast-growing realization that to readers and advertisers alike **CONTRACTORS AND ENGINEERS MONTHLY** offers much for all, more for most, most for more.

Four Major Points about C&E Monthly:

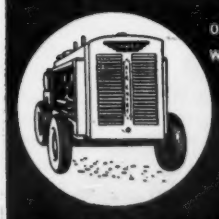
1. It carries more editorial material than any other monthly publication in the field.
2. It also carries a higher proportion of editorial to advertising content.
3. C&E Monthly carries more display advertisers than any other monthly, and,
4. More exclusive advertisers.

Contractors and Engineers Monthly

the NEWSpaper of highway and heavy construction

470 Fourth Ave., New York 16, N.Y.

DAVEY COMPRESSORS



ONLY COMPRESSOR WITH PERMANENT PEAK EFFICIENCY LIFETIME VALVES

DAVEY COMPRESSOR CO. KENT, OHIO

Ply-Garb protective clothing now features luminiscent striping.

Luminous Clothing Adds to Job Safety

Protective clothing with luminescent striping has been designed by the Milburn Co., 3244 E. Woodbridge, Detroit 7, Mich., for employees whose jobs entail working in dimly lighted construction areas or on highways with no illumination. All styles of the company's Ply-Garb protective clothing can now be had with the striping, which reflects the light of approaching vehicles or moving equipment and warns operators of the worker's whereabouts.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 129.

New Tandem Roller; Enclosed Gear Box

The latest 5 to 8-ton tandem rollers manufactured by Acme Iron Works, P. O. Box 2020, San Antonio, Texas, have a fully enclosed transmission box designed to give trouble-free service. These Ingram rollers feature a new sliding-gear transmission with two forward and two reverse speeds. They are powered by 41-hp International U-6 gasoline engines, or 39-hp UD-6 diesels, both of which have electric starters, generators, air cleaners, and variable-speed governors. The roller gear box is a fully enclosed self-contained unit to prevent dirt and road grime from entering. The gears run in an oil bath.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 126.

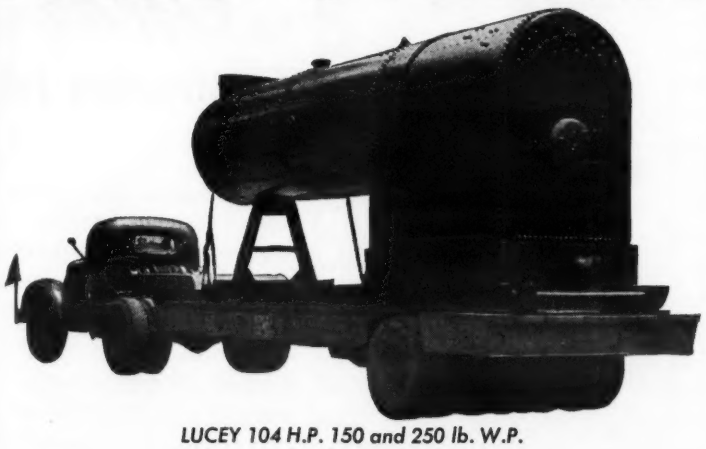
Hay-Chopping Machine Adapted to Mulching

An adaptation of the Papec hay chopper, conventionally a farm machine, offers a mulching tool for contractors and highway departments doing roadside development work. The machine used is a standard Model L hay chopper manufactured by the Papec Machine Co., 30 W. Main St., Shortsville, N. Y., to which an auxiliary power unit has been added. The chopper is towed behind a truck carrying bales of hay. The bales are broken and thrown onto the chopper table by a man on the truck. The Papec chops the material and then blows it onto the road shoulder through a flexible delivery pipe. The operation proceeds at a walking speed, Papec points out, and the machine makes mulching considerably less expensive than when the spreading is done by hand.

A Papec hay chopper, with an auxiliary power unit, chops hay to be used as mulch and blows it onto road shoulders through a flexible delivery pipe.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 132.

NEED STEAM?



LUCEY 104 H.P. 150 and 250 lb. W.P.
Skid mounted with 24" oil burning base.

LUCEY Inside Seal-Weld Double Calked BOILERS

1. 1040 sq. ft. heating surface.
2. 160 cu. ft. furnace volume.
3. Ample steam volume 54 cubic feet.
4. Oversize seamless firebox.
5. Butt straps calked and seal welded inside.
6. Four-inch water space around firebox.
7. Boilers available from 40 to 150 H.P. Working Pressures from 125 to 350 lbs.

Write for descriptive literature.

LUCEY and **LUCEY BOILER MANUFACTURING CORPORATION**
Chattanooga, Tenn.

SMOKE STACKS • BREECHINGS • FLY ASH REMOVAL UNITS
ASME UNFIRED PRESSURE VESSELS

1 Man easily handles all these jobs with LaCrosse Tilt Trailer

Delivers parts, poles, pipe, etc.

Just plug in side stakes (extra) and you're ready to haul all sorts of unwieldy loads, including long pipe, poles, lumber.

Hauls topsoil, gravel, coal, etc.

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AUTOMATIC TILTING and leveling, plus simple safety lock on new LaCrosse tilt trailer, makes it easy for one man to load and unload heavy machinery in a hurry, without skids or blocks. 6 to 10-ton load capacity . . . single or tandem axle . . . sure-stop LaCrosse air or vacuum brakes. Ideal for contractors, counties, cities, etc. . . . also profitable for "one-man business" or side-line. Low in cost . . . easily hauled by any 1-ton truck with pintle hook . . . backed by 16 years of LaCrosse engineering leadership. Write for details. LC-7

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"Fierce" Competition Noted at AGC Parley

(*Continued from page 1*)

the phenomenal growth of the west in the past 100 years. California, said Governor Warren, has not reached a point of stagnation. Future plans call for even greater expansion, and construction will be the tool which will make it possible.

Throughout the convention, speaker after speaker stressed the increasing competition between contractors. An annual survey, recently completed by AGC, foretold a competitive situation which may be worse than the middle 1930's. The survey indicated this to be the case, despite the fact that a large volume of work is coming on the market. The survey showed that 1950 can possibly be a record year volume-wise on the national construction scale.

Contractor's Surety Explained

"A Joint Venture: The Contractor and His Surety" was the title of a talk by Henry G. Sheehy, Vice President of Massachusetts Bonding & Insurance Co. Sheehy told the delegates that the basis of surety is mutual understanding, and that character is its cornerstone.

The Munsey Trust Co. case decision handed down by the United States Supreme Court was detailed by Sheehy, who said it was to the contracting business "what the atom bomb was to Hiroshima". Sheehy told how the Government had withheld $6,700 which a defaulted contractor owed on another case, and there was nothing further the surety company could do until the law was changed.

Highways Discussed

America's highways, her No. 1 "muddle", were examined with concern by delegates and speakers. D. C. Greer, President of the American Association of State Highway Officials, asked, "Shall we wait for traffic's knockout punch?"

It will not be enough, Greer said, for the AASHO merely to recommend to Congress that Federal Aid be increased to $810,000,000 annually, and that the classification of highways be expanded to include a fourth classification: the Interstate Highway System. If America's highway system is ever to catch up with motoring demands, Greer warned, other groups such as the AGC will have to help their state highway officials at national and local level with a cooperative program of performance and public relations.

In a discussion of what could be done to secure more uniformity from state to state on weight limitations of construction equipment being transported from job to job, Greer pointed out that the problem was extremely complex. Weights could be standardized generally at only two levels, he explained: at the lowest and highest levels.

What Greer emphasized was echoed in another form by Carl E. Fritts, Director of the Highways Division of the Automotive Safety Foundation. Fritts called for an end to "horse and buggy" methods in highway planning and financing, and for the substitution of adequate long-range planning programs. Fritts told the delegates that the United States, with the finest highway plant ever built, was the victim of the world's worst traffic muddle.

"This is a critical hour", he said. "The terrific upsurge of traffic, the highway deficiencies created by war and depression, the rapid obsolescence due to stepped-up speeds, weights, and concentrations of vehicles, the dangerous increase in congestion in cities, the appalling toll of accidents—all of these things face us with a grim and inescapable challenge."

To meet the challenge, Fritts declared, "We must reorient our views and perspectives."

Exactly how perspectives might be reoriented was suggested by Dr. L. I. Hewes, Chief of Western Headquarters of the Bureau of Public Roads, who presented a new idea he called the "Block Bond" scheme.

"It's an idea to finance a most urgent limited or blocked-out mileage in a state system by bonding against the blocked earnings on that limited mileage alone", he explained. "Generally in a state there would be only a few hundred miles that would, as a blocked group, be as a whole profitable on their own user revenues.

"There would be no subtraction from revenues earned elsewhere. Legislation would set up authority simply to capitalize the blocked earnings and build now on a blocked mileage. The areas in which the corresponding user revenues were pledged for debt service would be debited with the cost of that service."

Dr. Hewes went on to cite a parallel in comparable private or corporate business situations, where money could be borrowed partly against earnings of expected new business for debt service. It is necessary to step up capital investment in construction, Hewes said, in order to offset the ever-rising cost of maintenance, which in 1948 amounted to 39 per cent of the total road dollar program.

Building Research Explained

Building contractors were told what the Building Research Advisory Board is, what its objectives are, and something of its conception. These facts were explained by William H. Scheick, Executive Director of BRAB, at a luncheon meeting.

Explaining that BRAB is a unit of the National Research Council, which in turn is the principal operating arm of the National Academy of Sciences, Scheick said that BRAB would be to building research what the Highway Research Board is to highway construction and materials research.

Scheick listed six major objectives of the Building Research Advisory Board as follows:

1. To conduct research correlation conferences and forums.
2. To begin an analysis and classification of building research.
3. To conduct a survey to identify problems of the building industry that stand a chance of being solved by research.
4. To stimulate cooperative field trials of research results by a collaborative program between contractors and research agencies.
5. To encourage government agencies to avail themselves of the advisory services of BRAB.
6. To develop a program of publication and information.

One of the AGC concerns, expressed throughout the building sessions, was the necessity for doing everything possible to encourage the expansion of building by private and industrial concerns. At general and special meetings, the ever-growing dependence by contractors on public works by governmental agencies was voiced.

(*Continued on next page*)

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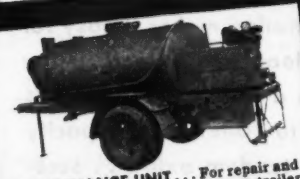

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While light in weight, Naylor Pipe is built with exclusive strength and safety features that permit broad application not possible with ordinary lightweight pipe.

Whether it's pipe lines for high and low pressure air or water, push-pull ventilating, de-watering and drainage, dredging, hydraulic sluicing, sand and gravel conveying or other service, it will pay you to take advantage of the extra utility provided by Naylor light-weight pipe.

Sizes from 4" to 30" in diameter and thicknesses from 14 to 7 gauge. Write for Catalog No. 44 for full details.

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Heavy Contractors: Heavy Sessions

How electrical and gas utilities companies have furnished contractors the kind of private work they seek was told by Robert R. Gros, Publicity and Advertising Manager of Pacific Gas & Electric Co., as he warned the delegates that efforts were now under way to socialize the power industry.

Gros called the postwar expansion of the gas and electric utility companies "magnificent".

"Starting from V-J Day, with their resources strained by wartime growth without the opportunity to build as they would normally have, the utilities in just five years have met postwar growth and restored reserves, in the case of electricity, to a point approaching prewar standards of spare capacity", Gros said.

Going back to the days when Secretary of Interior Ickes called the "Big Inch" pipe line "too big for private enterprise to build", Gros told his audience that PG&E now has under construction the "Super Inch", a 34-inch gas line 1,600 miles long from El Paso, Texas, to Milpitas, Calif.

Gros pointed out that by the end of 1951 private electric companies will have invested $9,000,000,000 in new construction since the end of the war. "Every cent of that is investment money", he said. "Nobody was taxed to raise it, and it goes into utility properties that are all on local tax rolls. By contrast, government-owned utility properties are exempt from taxation.

"Release private enterprise from unfair tax-free government competition and bureaucratic sabotage, and you need have no fear that we will not measure up to our responsibilities," he said. Gros reminded the AGC members that they would be hard-pressed to compete with Government public-works agencies, if the agencies operated with tax-exempt liberties.

In two crowded sessions, representatives of the Heavy and Railroad Contractors Divisions heard how their committee, working with Bureau of Reclamation Officials, had streamlined specifications, bidding procedure, and plans, with a saving of millions of dollars to the projects.

George Atkinson, President of Guy F. Atkinson Co., told how major bid quantities might now be split into two divisions: a guaranteed minimum, and a second estimated quantity for possible overage. This idea, which he called "the most revolutionary thing in contract bidding", would permit contractors on large jobs to charge permanent but costly items like mobilization and camp expense to preclude heavy losses on these items in case the major quantities were short, which has sometimes been the case.

Atkinson also pointed out that projects could be done faster, cheaper, and with better administrative control if contractors were permitted to furnish all materials.

However, all relations between AGC and the USBR have not been satisfactorily adjusted, it was pointed out. Atkinson reminded the delegates that the lack of pre-bidding data on big jobs was still a sore point, and suggested that better data be secured and then given to the contractor for his own interpretation.

Progress is being made, Atkinson said, on the matter of incomplete plans and details, better excavation classification, and promptness in making adjustments.

The perplexing inspection situation was discussed in some detail both by Atkinson and by Grant Bloodgood, Construction Chief of the USBR, acting for Chief Engineer C. N. McClellan. Atkinson said that a recent survey indicated that contractors felt that some improvement in inspection had been made, but that about two-thirds of the contractors felt that no improvement had resulted. Bloodgood said that investigations by his office revealed cases of unstandardized inspection, and that efforts were now under way to adjust this situation. "But it is hard to correct the habits of a lifetime", Bloodgood admitted, speaking of his field personnel.

Corps of Engineers work was detailed by Colonel W. D. Luplow, Acting Division Engineer of the South Pacific Division. Colonel Luplow told how the Corps had contracted for the removal of Blossom Rock in San Francisco Bay in the 1870's, and how contract work had now reached a new high. Over 29 large jobs were described by Colonel Luplow, who also praised the AGC for its cooperation in the establishment of Engineer Reserve Units.

Colonel Luplow met some competition on the same program, however, when a plea for more Seabee Reserve units was voiced by Captain A. D. Hunter, Deputy Chief of the Navy Bureau of Yards and Docks. Reminding his audience "that there's a big difference between a Civil Engineers Corps officer and these government jokers who wear sleeve guards and celluloid collars", Captain Hunter said there now existed between the Navy and the AGC a "streamlined contractual relationship" which would be of value in the future if another war came along.

Captain Hunter praised the ability of contractors generally, and told how a young resident officer in charge of construction on a Virginia job reported that things "went a lot faster when he stayed the hell out of the way".

(Concluded on next page)

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MIGHTY-MIDGET PULLER

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Make the Mighty-Midget Puller a standard tool in your shop. See how it saves time and muscle power on scores of jobs. Write for the name of your nearest Coffing dealer and for illustrated Bulletin No. C4MP.

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1. Continuous load take-up feature walks up chain and tightens to any desired tension.
2. Drop forged hooks provide added strength with sure-grip on binding chain.
3. Clevis design and construction positively eliminates spreading or release in any way while in operation.
4. Each loader individually tested at factory on specially designed hydraulic testing machine.
5. Most inexpensive continuous loaders on the market.
6. Four sizes fit all requirements from light hauling to heaviest commercial uses.

No. 17 — 6000# rated capacity on ⅜" x 7/16" chain $3.95 ea.
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No. 24 — 30,000# rated capacity on ½" x ⅝" chain $11.50 ea.

Write for complete information and dealer discounts.
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Available for immediate shipment.

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"Fierce" Competition Noted at AGC Parley

(Continued from preceding page)

In general, heavy construction is getting more difficult and the projects more complex, delegates were warned. That will call for more and more ingenuity, better equipment, and lower-cost methods of construction as time goes by.

Resolutions Adopted

Resolutions were adopted which called generally for action on a national scale which would further the contract system. An omnibus resolution, calling for maximum efficiency in construction, welcomed continuing competition, but said that contracts should be let by agencies to "responsible general contractors, so full advantage could be taken of free and open competition".

The resolution also said that one all-inclusive general contract on each project was preferable to subdivision, because complete responsibility and coordination could be centralized in one competent organization. Government agencies should not hamper the operation of established industry practices, or upset established relationships between employers and workmen.

Other resolutions went on record opposing the establishment of valley authorities patterned after TVA; and for the change in bidding practice which would permit contractors to furnish all materials for a project. Another resolution recommended that the administration of all unemployment compensation funds should be placed in full control of state government. A continuation of the AGC apprentice training program was also recommended.

Corrective action in regard to standard Federal construction contract forms which deny contractors and contracting officers access to a court of law was recommended.

Retirement Plan Defeated

In a lively parliamentary exchange, a move to set up a retirement fund for AGC staff members was defeated in the closing minutes of the convention by members on the floor. Findings and recommendations of the committee were set aside, and the matter of retirement funds for AGC staff members was tabled.

New Officers Elected

Walter L. Couse, President of Walter L. Couse & Co. of Detroit, a building contractor, is the new President of AGC. The new Vice President is Glenway W. Maxon of the Maxon Construction Co., Dayton, Ohio, a heavy-contracting organization.

Division Chairmen include D. A. Harmon of the Harmon Construction Co., Oklahoma City, in the Building Division, with H. C. Turner, Jr., of Turner Construction Co., New York City, as Vice Chairman.

N. K. Dickerson, Jr., of Dickerson, Inc., Monroe, N. C., is the new Chairman of the Highway Division, with H. C. Miller of the San Ore Construction Co., McPherson, Kans., as Vice Chairman.

In the Heavy-Contracting Division, John MacLeod of the Macco Corp., Paramount, Calif., is the new Chairman, with George Heller of Johnson, Drake & Piper of Minneapolis as Vice Chairman.

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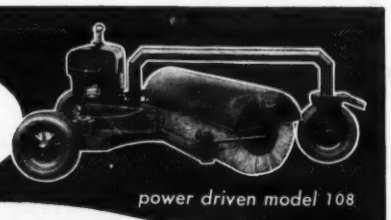
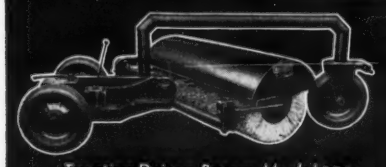


power driven model 108

HIGHWAY BROOMS



Traction Driven Broom Model 106

Traction Driven Broom is powered by the rear wheels.

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LITTLEFORD Power Driven Model 108 and Traction Driven Model 106 Highway Brooms have the Hydraulic System for raising and lowering the Broom—and too, this hydraulic system saves wear on the broom, because the tension on the road surface can be regulated. There's no need to have the full weight of the broom resting on the road surface.

MONO-FRAME CONSTRUCTION of the Littleford Highway Brooms makes these units sturdy, yet light weight, gives the operator better vision of the broom, makes it easy to handle and shortens the turning radius.

TWO-WAY BROOMS—both Littleford Brooms can sweep in either direction and it takes only 30 seconds to change from one direction to the other. Both models can be equipped with Sprinkler System and model 108 Power Driven can be equipped with a Dust Blower Unit.

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New, improved STA-VIS Form Oil Concentrate costs less, does a better, cleaner job, saves space and handles more easily than ordinary form oils at half the cost.

- No discoloration—saves time and labor.
- Applied with spray, brush or dip.
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- Acts as a rust preventive on steel forms.
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TO CONSUMERS:

One gallon of STA-VIS Form Oil Concentrate, mixed with water, makes 21 gallons of form oil ready to use. Write for price list and complete product information.

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Some distributor territory still open. Our liberal distributor plan will be of interest to you. Write for complete information on this popular item.

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"TOE SAVER" BOOTS

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Est. 1870

A Powder-Actuated Tool for Fastening

An improved powder-actuated fastening tool, the new Drive-It 300, has recently been introduced by the Powder Power Tool Corp., 0705 S.W. Woods St., Portland 1, Oreg. It features controlled power by which the penetration of the fastening pin can be varied for materials of different densities. This eliminates the need for using three or four different powder charges and enables the user to gage accurately the power required to do the job at hand, the company says. Another innovation is a flangeless drive pin, said to be less expensive and to eliminate the necessity of digging the sheared flange from the barrel.

The new 300 also features three-way safety, semisilent operation, twist-of-the-wrist firing (no pushing or hitting), a built-in safety pad, and an automatic extension barrel to reach narrow places.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 45.

Scoop Attachment For Fork-Lift Truck

A new hydraulically operated Scoop-Shovel for use with Lift King and Worksaver electric and gasoline fork trucks is manufactured by The Yale & Towne Mfg. Co., 4531 Tacony St., Philadelphia, Pa.

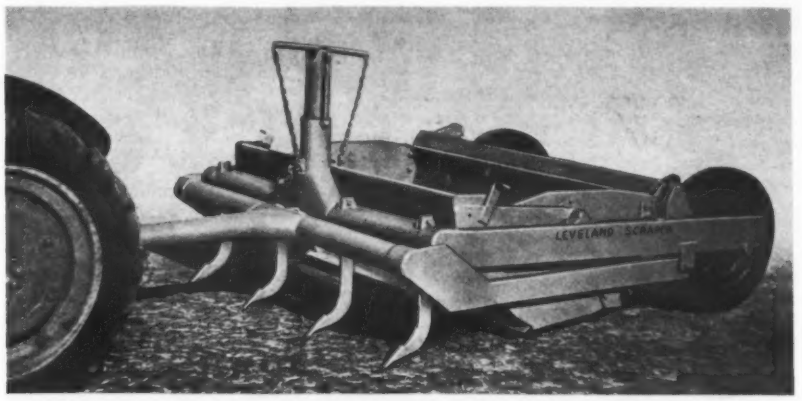
The scoop handles up to 27 cubic feet of material. It tilts upward from the horizontal scooping position to cradle the load during transport, and tilts downward to discharge the load completely when dumping. The device scoops at the ground level or digs into piled material.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 54.

A One-Yard Scraper For Small-Size Jobs

A new one-cubic-yard scraper for small earth-moving, grading, land-leveling, and soil-conservation jobs has been announced by the Western Equipment Mfg. Co., P. O. Box 105, Glendale, Calif. The Overland scraper fits the Ford tractor; the Leveland scraper fits Farmall, H & M, International, Case, John Deere, Massey Harris, and Allis-Chalmers tractors. The latter is also available in a 1½-yard model.

One tractor hydraulic control regulates the scraper for all loading, carrying, and dumping operations. A controlled spreading depth of 7 inches can be obtained. The automatic hitch keeps the front end of the tractor on the ground while the scraper is loading, to allow fast loading and automatic regulation of the cutting edge of the scraper. The hitch provides an important safety feature and reduces tractor



The Leveland scraper comes in 1 and 1½-yard models for Farmall, International, Case, Deere, Massey Harris, and Allis-Chalmers tractors.

wear. Four ruggedly constructed ripper teeth mounted on the front of the scraper enable it to work dry or gumbo soils. The teeth are adjustable for the depth of ripping desired. They lift out of the ground when the scraper is raised to carrying position, and they do not interfere with tractor tires when turning. The scraper can be used as a plain ripper or can be used to rip and load at the same time.

This one-yard scraper has a 5-foot cutting blade, an overall length of 10 feet, an overall width of 5 feet 9 inches, an overall bowl height with blade on the ground of 24 inches, and a ground clearance of 8 inches.

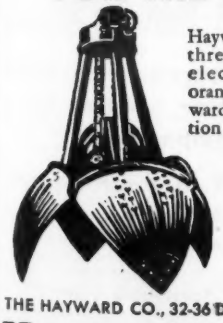
Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 142.

Spot Welder With Timer

A catalog sheet on the Birdsell 4.6-kva No. 130T spot welder with electric timer has recently been prepared by Birdsell Products, P. O. Box 733, Los Altos, Calif. The unit operates on single-phase 220-volt power. Its features include water-cooled electrodes and secondary coil, capacity for two pieces of 16-gage cold-rolled steel, operation through a simple 60-amp switch, and economies in operation through the use of an electric timer.

This literature may be obtained from the company, or by using the Request Card at page 16. Circle No. 40.

USE RIGHT BUCKET FOR THE JOB



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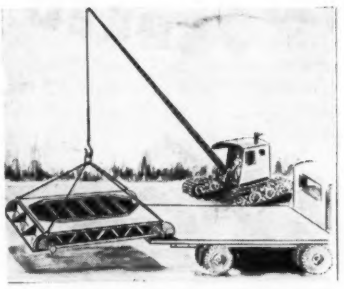
THE THURMAN PORTABLE TRUCK SCALE can be moved from job to job by removing 6 nuts which hold side arms in place. The rest of the scale can be lifted as a unit. Scale can be moved and readied for use in a few minutes as no adjustments are necessary.

EXTRA LARGE STEEL BASES support the scale, thus requiring no concrete footings. Scale furnished with Chrome-plated weighbeam—other vital parts are electro-plated to prevent rust and corrosion. Immediate Shipment.



Ask for information on other types including wheelbarrow scales, batching scales, and pit-type truck scales.

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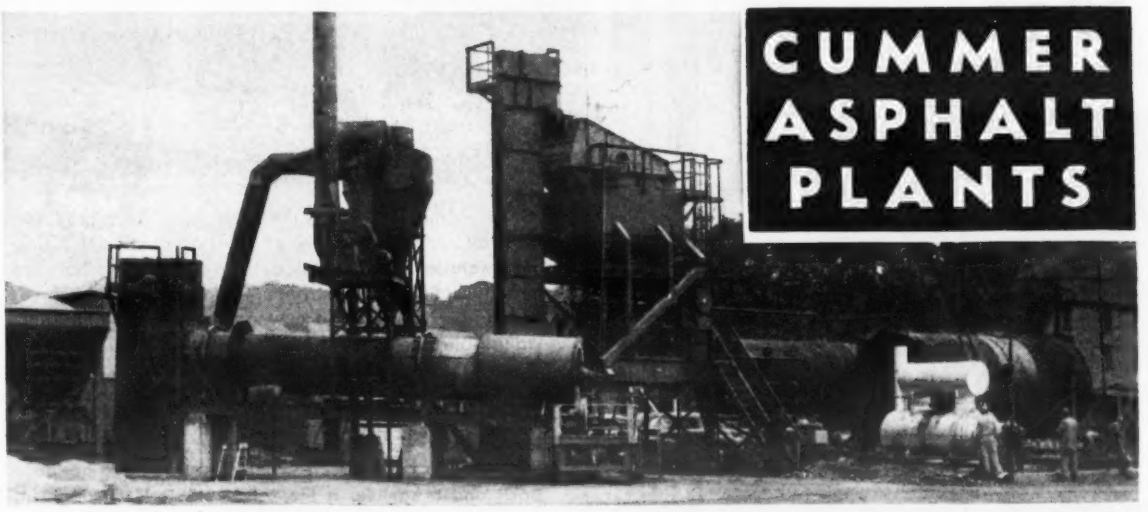

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- Equipped with feeder bin and feeder
- Dust collector discharging reclaimed dust into hot elevator
- Complete with storage tanks with hot oil heat
- Combustion by oil and low pressure air
- No steam used on plant

Sizes from 25 to 100 Tons (drying and mixing units) available

PROMPT SHIPMENT OF ALL SIZES

Feeders — Storage Bins — Pumps — Timer

Literature on request

THE F. D. CUMMER & SON COMPANY

BUILDER OF FINE ASPHALT PLANTS

Cleveland 15, Ohio USA

New Design Features Improve Earth-Mover

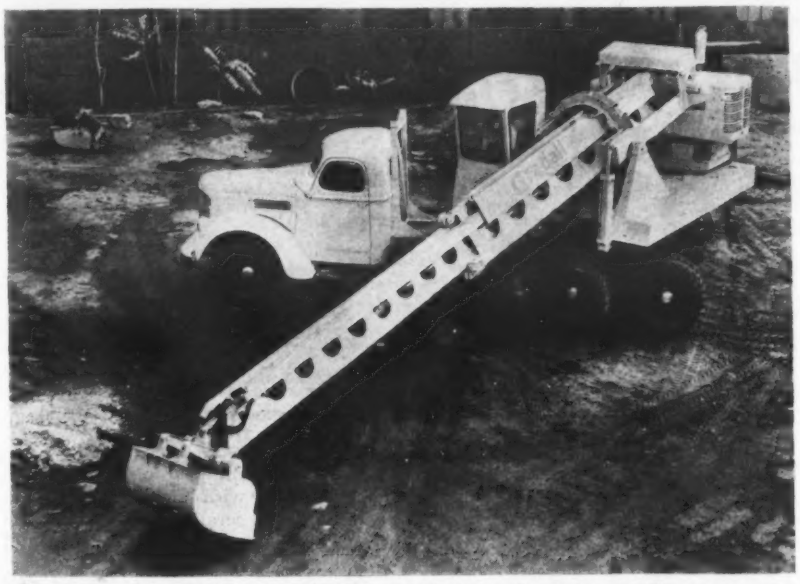
New design refinements of the Gradall excavator have been announced by The Warner & Swasey Co., 5701 Carnegie Ave., Cleveland 3, Ohio. Width of the circular roller path around the circumference of the main turntable has been increased to permit the use of larger bearing rollers. In addition a bogie-mounted pair of rollers has taken the place of each single tapered roller formerly used, so that eight rollers share the load formerly handled by four and give greater stability.

Relocation makes the control valves easily accessible for inspection and service, and the amount of piping has been reduced. A simple mechanical linkage connects the valves with the operator's control handles and pedals. Relocation of the valve manifold has permitted the redesign of the operator's cab, now equipped with an inclined front window and single-pane side windows for greater visibility.

A 2,000-pound counterweight at the inboard end of the main boom balances the extended portion of the telescoping boom and is said to increase its lifting capacity by permitting more of the power input to act directly on the payload. Elevating cylinders, formerly located below the inner end of the boom where they exerted an angular thrust on the base of this triangular member, have been moved forward so that they act at a point just ahead of the trunnions. Here a straight thrust with a minimum of pivoting is possible.

The boom extension—formerly supported at the end of the stationary boom section by three concave rollers riding circular pipe components welded at each point of the triangular boom—now rides on five rollers. A concave roller has been retained at the top, but two flat rollers split the bearing load at each of the base positions.

Stuffing-box bearing lengths have been increased for better bearing. Larger, harder wear rings are being used on piston heads. Welding has been virtually eliminated from cylinders to do away with the possibility of weld scale fouling the hydraulic system. Redesign of the main boom cylinder has permitted the elimination of one of the four hydraulic pumps previously required. A net increase of 2 tons in gross weight has resulted from the various design changes. The Gradall is now offered with a diesel power unit as optional alternate to a gasoline engine.



New design refinements of the Gradall excavator give it greater stability, wear, and lifting capacity. A diesel power unit is optional in place of a gasoline engine.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 37.

Powdered Compound For Case Hardening

A quick-acting steel-hardening compound, Hard-N-Deep, has been developed by The Miracaloy Corp., 50 Broadway, New York 4, N. Y. A powdered chromium-carbon material, it contains a catalyst XL-7, which speeds up the hardening process and allows the compound to work at relatively low temperatures. Hard-N-Deep penetrates the surface of the part being treated and produces a carbonizing, nitriding, and chromizing action. The result is said to be a uniform case without appreciable change in surface dimensions.

Features claimed for it are its speed, simplicity, and its ability to be used with standard shop equipment. The part to be hardened is heated to a cherry red, dipped in the compound, brought back to temperature, and quenched. One treatment produces a case of about 1/32 inch, Miracaloy says. Deeper penetration can be obtained by additional applications.

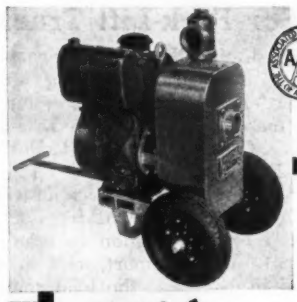
Hard-N-Deep is packed in 1, 3, 5, and 10-pound cans and in 25, 50, and 100-pound drums.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 119.

Steel Dump Bodies And Hydraulic Hoists

A broadside, Form 121A, presenting the Daybrook line of hydraulic hoists and steel dump bodies, is available from The Daybrook Hydraulic Corp., Bowling Green, Ohio. Fully illustrated, it highlights a hoist for every truck application. A full-page drawing of the Speedlift pump points out all features of this "heart" of the hydraulic system. More than 12 different models of steel dump bodies with a wide range of construction applications are described and illustrated.

This literature on Daybrook hoists and bodies may be obtained from the company, or by using the Request Card at page 16. Circle No. 68.



NEW! a modern line of self priming-centrifugal CONTRACTORS PUMPS by McGOWAN

Here's the pump with high capacity at low operation speed for longer engine life. All-welded construction for lighter, stronger, more durable unit. Automatic priming — no moving parts or jets. Improved non-clogging impeller of special iron alloy. Hardened wear plate, for longer life. Fewer moving parts—hence less wear and lower maintenance cost. Large access plates—making inspection and repairs easier. Fully tested and trouble-free shaft seal.

All McGowan Pumps comply with contractors pump standards as adopted by the AGC. New Units—Rental Units. Repair Parts carried in stock by nation-wide dealers.

LEYMAN MANUFACTURING CORP., CINCINNATI 2, O.

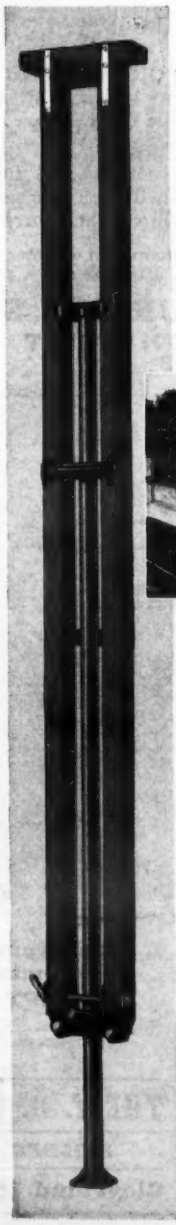
jari CUTS 12 MILES A DAY!

Think of it . . . one man cleans up 12 miles of highway shoulder in a single day . . . with Jari. Yard wide knife cuts weeds, mows park lawns. Light easy-to-handle Jari cuts on steep slopes . . . gets in where big rigs can't.

HERE'S GOOD NEWS Jari Power Spray Attachment kills weeds with 14 foot wide spray. Hose reaches trees. Write for full details.

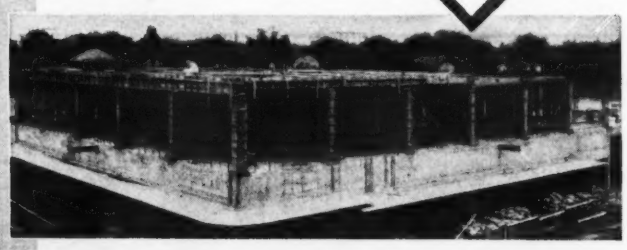
jari Jari Products, Inc. 2940R Pillsbury Ave. Minneapolis, Minn.

POWER SCYTHE AND SPRAY



SAVINGS SAFETY SPEED

ROOSHORS and ROOS Column Clamps



● On countless buildings throughout the nation . . . large or small . . . Rooshors have effected great savings in time and material over outmoded 4 x 4 shoring. Rooshors are readily handled by one man—transporting, setting, releasing and moving to a new location. They are instantly adjustable within their three ranges of sizes: 8 ft. to 14 ft., 7 ft. to 13 ft., and 5 ft. to 9 ft.—higher stories are shored with Roos Extension Shores:

Roos Column Clamps—the foolproof clamp—save countless manhours. Each clamp is identical to the other and it is *impossible to put them on wrong* . . . they have no loose parts and a hammer is the only tool needed to tighten.

Rooshors and Roos Column Clamps are available for rental or purchase from warehouse stocks from coast to coast.

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Contractors & Engineers Monthly
470 Fourth Ave.
New York 16, N. Y.

This air-tight case holds both chalk line and pigments. Self-locking handles fold flat after the chalk line has been pulled out, used, and reeled in.

New Chalk-Line Box

An air-tight case for holding both line and pigment is a feature of the new chalk-line box produced by Strait-Line Products, P. O. Box 417, Santa Ana, Calif. Recently introduced in conjunction with the firm's specially prepared chalk-line pigments, the new containers have self-locking handles that fold flat after the chalk line has been pulled out, used, and reeled in. This flat position of the handles when locked simplifies pocket carrying as well as storage in tool boxes or chests. Field men have also used the chalk-line box as a plumb bob, the company says.

The strong but lightweight boxes are molded of aluminum alloy. By two "coin-slot" screws, mechanics may easily and quickly refill cases with a choice of red, blue, yellow, or white pigment refills. Each box is furnished with 50 feet of line; each has a capacity, however, of 100 feet.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 32.

Portable Pneumatic Tools

A series of catalog insert sheets describing a full line of portable pneumatic tools has recently been prepared by Master Pneumatic Tool Co., Inc., Orwell, Ohio. Hard-chromed for longer wear, these tools include backfill tampers, buffers, butts, chipping hammers, chisels, cone and die grinders, drills, peins, rammers, masonry grinders, sanders, and wire brush tools. Each of the catalog sheets indicates the number of the designated model, illustrates the tool, and lists applications, features, and specifications.

These sheets may be obtained from the company by specifying the particular tool in which you are interested. A 4-page bulletin MPT 4823, briefly describing the entire line may be obtained from the company, or by using the Request Card at page 16. Circle No. 42.

Aluminum Scaffolds Are Easy to Handle

Designed for heavy construction and maintenance work, the new aluminum-alloy Tube-and-Coupler scaffolds fabricated by Up-Right Scaffolds, 1013 Pardee St., Berkeley, Calif., are lightweight and easy to handle. They may be erected in any size and shape and they have the following features, according to the manufacturer: reduced erection and dismantling time; light weight for handling and lifting; swivel base plates that require no wedging; and rapid assembly with the new Up-Right couplers, locking tubes, and swivel plates.

Other features of aluminum construction are a greater gripping friction of couplers against tubes and longer life due to corrosion resistance. The light weight also serves to decrease the dead load on the lower framework. The heavy-duty scaffold, the company says, will carry 75 pounds per square foot with a safety factor of 4.

Further information may be secured from the company. Or use the Request Card at page 16. Circle No. 128.

Controlling Water Seepage In Masonry Construction

A 4-page folder on Pruftite, a sealing agent for controlling water seepage and dampness in brick, concrete, cement, plaster, stucco, and concrete masonry has recently been issued by Prufcoat Laboratories, Inc., 63 Main St., Cambridge, Mass. The catalog points out that Pruftite is a clear liquid chemically designed for efficient absorption into masonry surfaces. Applied by brush or spray, it penetrates the pores, capillaries, and cracks in masonry construction and dries both within and on the surface by evaporation of the volatile solvents. Results of tests performed by an independent laboratory on both treated and untreated specimens are quoted in the folder. The three types available are fully described.

A question-and-answer section of the bulletin indicates on what surfaces Pruftite may be used, how it is applied, number of applications required, its coverage, and its effective life. It explains that Pruftite is designed for use as a straight waterproofing material or as a waterproofing primer before a finish or paint is applied.

This literature may be obtained from the company, or by using the Request card at page 16. Circle No. 146.

A HITCH ALL, TWO WHEEL
All-Purpose, "Take-it-or-leave-it"
MORRISON
Carry-All
TRAILETTE
that Hitches to Any Light Truck or Passenger Car

The MORRISON "Carry-All" TRAILETTE . . . Model B910-T 37¼ cu. ft. compartment area, 30½ sq. ft. floor area.

Small businessmen who do not want to invest in a truck chassis — or who use their passenger cars in their businesses . . . traveling salesmen who carry bulky sample cases or many products . . . farmers who can't tie up their trucks for small deliveries . . .

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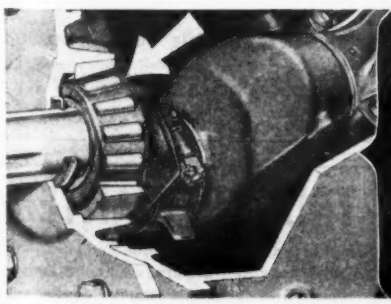
Sportsmen and tourists and all other travelers . . . all these can easily and quickly hitch the "Carry-All" TRAILETTE to passenger cars or trucks — loaded, locked and ready to roll.

All "Carry-All" equipment can be mounted on the TRAILETTE . . Write for Bulletin B30-4-A

The MORRISON "Carry-All" TRAILETTE is carried in stock for immediate delivery to franchised chassis dealers by more than 50 established truck equipment distributors strategically located from coast to coast.

MORRISON STEEL PRODUCTS, INC.
Carry-All Body Division
643 AMHERST ST., BUFFALO 7, N. Y.



Why WISCONSIN HEAVY-DUTY Air-Cooled ENGINES Run on Timken Tapered Roller Bearings

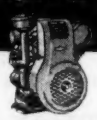
Ever since the first Wisconsin Air-Cooled Engine was built over 20 years ago, the crankshaft of every one of these fine engines has been supported by Tapered Roller Bearings at BOTH ENDS. Here's why:

1. Tapered Roller Bearings take up all *End Thrusts* and *Radial Loads* (impossible with other types of bearings). You can mount your drive directly on the extended crankshaft of any Wisconsin Engine without the need for an extra thrust bearing or outboard bearing.

2. Tapered Roller Bearings *resist* wear to a greater extent than other types of bearings not only because of the file-hard surfaces of Timken Tapered Bearings but also because these bearings are inherently SELF-CLEANING. Oil enters at the smaller end of tapered roller bearings and centrifugal force carries it out through the large end, thus preventing accumulations of dirt and sludge that is often present in the oil. (Tapered bearings cannot develop shaft-cutting abrasive surfaces.

3. Tapered Roller Bearings permit flexing of the crankshaft to a much greater degree than the longer, rigid plain bearings which cannot stand up under flexing conditions, resulting in wearing "bell-mouthed" or failing completely. We have yet to hear of a single case of Wisconsin Engine bearing failure.

The use of dependable Tapered Roller Bearings in ALL Wisconsin Engines from the smallest to the largest . . . 3 to 30 hp., single cylinder, 2-cylinder and 4-cylinder . . . is typical of the engineering diligence devoted to providing the user with "Most H.P. Hours of on-the-job service".


Single cyl. 3 to 9 hp.

2-cylinder 7 to13 hp.

V-type 4-cyl. 15-to 30 hp.

WISCONSIN MOTOR CORPORATION
World's Largest Builders of Heavy-Duty Air-Cooled Engines
MILWAUKEE 14, WISCONSIN

STOPS MOISTURE FROM FALLING INTO TRACTOR EXHAUST . . . Just slip the "RAINCAP" over the open end of your tractor exhaust, and you eliminate forever the danger of moisture falling into the exhaust, injuring your tractor. THE CAP THAT DOES NOT FORGET TO CLOSE . . . Completely automatic—the "RAINCAP" is counter-balanced to open when the tractor starts and close when it stops. Rust proof—made of cast aluminum with bronze bushing—can be installed in two minutes. F.O.B. Waterloo, Iowa.

Write Dept. C-1

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66	1⅜"	1.90
7	2½"	1.90
8	3"	2.50
9	3⅛"	2.50
10	3¼"	2.50
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125	4¼"	3.00
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1—Slightly used 1949 Mack Model E.H.T. demonstrator. Very good discount. Equipped with Tulsa winch, less fifth wheel.

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Gar Wood Model 511 Scraper.

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Gar Wood Double Drum Cable Control Unit for HD10 or D8 tractor.

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New Winch-Lift trailers—12 and 20-cu-yd. capacity.

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1—Guaranteed rebuilt P&H dragline or crane, 300B less bucket.....$6500.
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Model 955 P&H diesel dragline; 85′ boom, 2½-yd. bucket, Buda diesel engine.

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With Gas Engine $10,000.
With D-13000 Cat. $13,500.
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All 20-ton capacity—80′ boom, 15′ jib
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We have serviced instruments for over 30 years—our men are experts
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Electric shovels, ¾ to 10-yd. (10)
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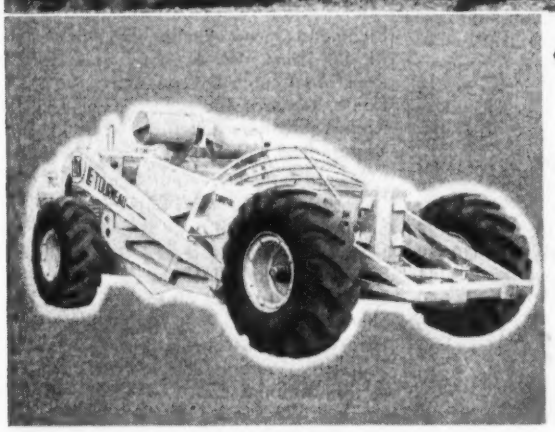

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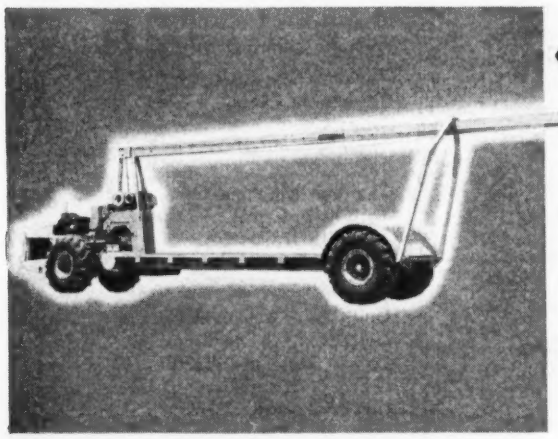

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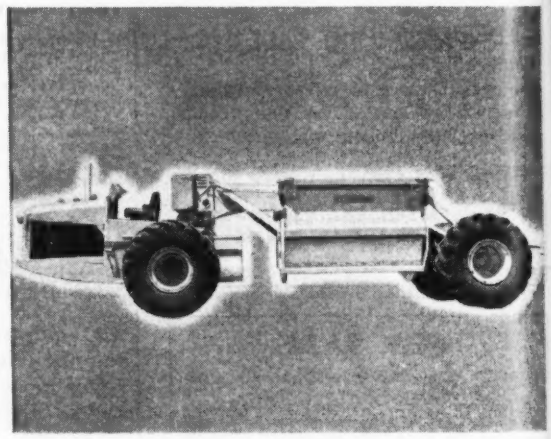

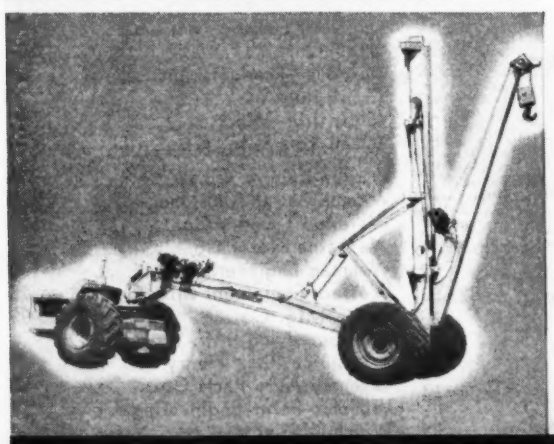

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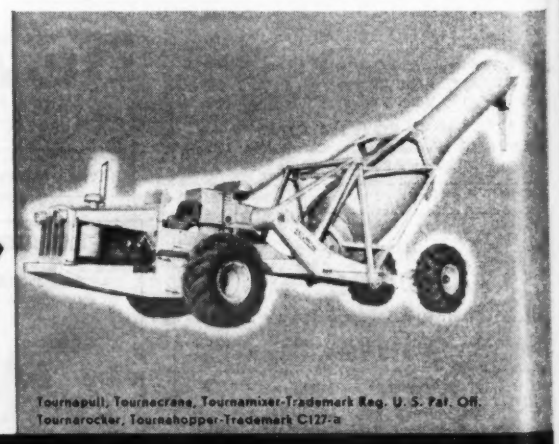

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